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**Pre-service Teachers' Perceptions of Cooperative Learning
in a Face-to-Face and 3D Virtual Environment: An exploratory study**

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Abstract

This study focused on exploring Chilean pre-service English teachers' perceptions regarding the use of structured cooperative groups to learn about Australian historical events and geographical information in the virtual world of Second Life and face-to-face. Currently, there is a dearth of research in the area of pre-service teachers' perceptions in the use of a cooperative approach to learning in these two types of environments. Additionally, it was important to understand if cooperative learning helps to improve pre-service teachers' preparation, regardless of the type of environment in which it is implemented.

A case study methodology with two case studies, each incorporating two embedded units of analysis, was used to have an in-depth look at the use of cooperation for teaching and learning in Second Life and face-to-face. The cases of Mr "R" and Mr "J" and their respective teachers in each environment were analyzed. Qualitative information gathered from interviews and focus groups showed that both case study participants perceived the use of a cooperative approach to learning as highly beneficial to not only improve their learning but also develop their social skills. Similarly, both teachers, Miss "A" and Miss "V", also reflected on the benefits of cooperation for improving their teaching practices. Qualitative data claims were backed up by quantitative information obtained from a Cooperative Learning Questionnaire and the achievement test. An ANOVA questionnaire analysis showed that there were no significant differences in cooperation perception in both types of environments. This means that cooperation is perceived similarly regardless of the context in which it is used. Additionally, an ANCOVA analysis was conducted for test results which showed that even though the virtual group performed significantly better the second time, the face-to face group also improved its performance the second time. This means that a cooperative approach to learning had a positive significant impact on both types of environments.

Based on the results of this study, the development of a framework to assist establishing cooperative group work in virtual environments is proposed. The framework combines Salmon's (2011) five-stage model, the elements that a structured cooperative group must comprehend (Gillies, 2007), Hannafin, Land and Oliver (1983) and Roehler and Cantlon's (1997) scaffolding components. The proposed framework stands as a helpful element towards effectively implementing cooperative learning in virtual environments and making virtual environments even more effective when used in a learning experience.

In summary, this study helped to explore Chilean pre-service English teachers' perceptions of the use of a cooperative approach to learn about Australia. It also contributed to create a holistic picture of the benefits that working under a cooperative approach entails, regardless of the context. Further, the use of a virtual world such as Second Life proved that cooperative learning can be fostered by the visualizations and sense of immersion that it is possible to achieve in this kind of environment.

Declaration by author

This thesis *is composed of my original work, and contains* no material previously published or written by another person except where due reference has been made in the text. I have clearly stated the contribution by others to jointly-authored works that I have included in my thesis.

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Publications during candidature

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Cooperative group work, Second Life, face-to-face, virtual worlds, pre-service teachers, higher education.

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List of abbreviations used in the thesis:

ANOVA	Analysis of Variance
ANCOVA	Analysis of Co-variance
Col	Community of Inquiry
CBLEs	Computer-Based Learning Environments
CVI	Content Validity Index
GUI	Graphical User Interface
IM	Internal Message
MUDs	Multi-User Dungeons
MOOs	Multi-user dungeons Object Orientated
MMORPGs	Massively Multiplayer Online Role-Playing Games
NLP	Neuro-Linguistic Programming
SL	Second Life
VWs	Virtual worlds
VEs	Virtual environments
VARK	Visual, Auditory, Reading and Kinaesthetic
ZPD	Zone of Proximal Development

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1. Introduction

1.1 Background to the study

Digital technology is rapidly transforming the society in which we live. However, the implementation of virtual worlds (VWs) and their utilization for educational purposes is very much in its early stages. The ground rules and practices of learning and teaching in VWs are being created and negotiated as educators and researchers develop what has become a new frontier for education. As this exploration is taking place, virtual worlds (VWs) are becoming increasingly firmly established, and are now immensely popular as sites for recreation and social activities (Ferguson, Sheehy, & Clough, 2010). Within the context of this study, the terms VWs and virtual environments (VEs) are used. VWs refer to “three-dimensional online representations of the physical world, where users are represented in-world by three-dimensional representations of themselves called avatars” (Stendal & Balandin, 2015, p. 1592). VEs have been defined as colourful, interactive, highly visual spaces which allow the representation of three-dimensional items (Hauptman & Cohen, 2011).

VWs provide users with the opportunity to access these spaces and environments from different locations since these worlds are *persistent*, that is, “the worlds continue even when a player logs out or quits a game” (Sanchez, 2009, p. 9). These environments can be designed to provide learners with active support, with abstract rules and concepts made explicit through symbol support. Learners have opportunities to explore environments and activities that would be difficult, risky or impossible to access in real life (Standen, Brown, & Cromby, 2001).

According to O’Connell and Groom (2010) VWs are changing the way we interact with others online. VWs such as Second Life allow users to be immersed into three-dimensional digital worlds, surrounding them with tangible objects to be manipulated and venues to be traversed. VWs extend the realm of computer interaction, from the purely visual to multimodal communication that more closely parallels human-to-human exchanges (Hale & Stanney, 2014). VW users not only see visual representations, they can also reach out and grab objects. However, such experiences do not have to be in solitude, as VW users can be accompanied by artificial autonomous agents or collaborate with other users who also have representations in the VW (Hale & Stanney, 2014). These

characteristics of VWs make them an ideal place for social interactions and cooperative learning to occur.

In the Chilean educational context, both the utilisation of technology and the implementation of the cooperative approach to learning are emerging and therefore not widely employed. This chapter therefore explains the Chilean educational context and the historical events which have shaped current teaching practice in Chile; and it describes the efforts being made to improve it. The chapter also outlines the aims, rationale and significance of the study, and provides an overview of the structure of this thesis.

1.2 The Chilean educational context

Over the past twenty years there has been a development of different policies directed at the improvement of teacher preparation and performance in many countries (Barker, Quennerstedt, & Annerstedt, 2013; Tulving & Kroll, 1995). Some policies have targeted the connection between teacher education and teaching in schools, as in the case of the “professional development schools” in the USA (The Holmes Group, 1995), or the creation in Uruguay of new types of institutions to widen the coverage and focus of teacher preparation (Vaillant & Wettstein, 1999). Despite the fact that all of these policies aim at enhancing teachers’ preparation, it is still possible to improve this area (Avalos, Tellez, & Navarro, 2010). Poor results by students drive the need to further teacher development and the belief that there is a direct relation between teachers’ preparation and students’ achievement is reported in both national and international evaluations (Avalos et al., 2010). According to a report issued by the Chilean National Commission for Educational Modernization, the Chilean educational system offers:

... wide but poor quality educational coverage which is inefficient and inequitable. Students who come from less affluent parts of the population have poor achievement levels. Instruction offered by schools is based on rote learning; it does not nurture personal development and learning skills. Teachers and students work and learn in a generally non-challenging environment (Comision Nacional para la Modernizacion de la Educacion, 1994, p. 28, Annex 1).

Additionally, in Chile there has been an unchecked development of pre-service teachers’ preparation programs in private universities together with the appearance of distance programs of questionable quality that have raised questions about how effective these programs are (Avalos et al., 2010). The government reaction has been to press for the closure of distance programs and to set a content-knowledge examination for future teachers in their last year of study (Avalos et al., 2010).

1.2.1 Teacher education in Chile

Historically, teacher preparation in Chile – for all the levels of the education system – has been in the hands of universities and a few tertiary level professional institutes (Avalos, 2009). These levels range from pre-school, basic (years 1 to 8), to secondary (years 9 to 12). During the military government period (1973-1990), these preparation programs were affected by severe institutional changes, staff dismissals, and a gradual lowering of numbers and qualifications of applicants, which affected their quality (Avalos et al., 2010). In Chile, the early 1990s were marked by the transition from a dictatorship to a popularly elected government (Avalos et al., 2010). Initial attempts at reform proceeded with caution in order to allay any suspicion that there was a concealed intent to revive the socialist principles which had been abolished after the military coup in 1973 (Avalos et al., 2010). Additionally, the last decade of military rule saw a diminishing level of publicly subsidised funds spent on the school sector (27% between 1982 and 1990) (Avalos et al., 2010). This had an impact on both teachers' incomes and their working situations, and affected the acquisition of necessary instructional materials by schools (Cox, 2003). This lack of funding also affected basic school education registration which showed a steady decline from 98% to 93% between 1985 and 1990 (Cox, 2003).

In the mid-1990s, and to improve the preparation programs affected during the military period, the government funded improvement projects for 17 universities through the creation of the "Program for the Strengthening of Initial Teacher Education" (Avalos et al., 2010, p. 12). This initiative resulted in changes to the curricula of all participant institutions, improvements in teacher education capacity, and increased opportunities for practicum and field experiences as part of the program (Avalos, 2005). Within the framework of the *Program for the Strengthening of Initial Teacher Education*, the creation of a sub-program named "Program for the Improvement of Quality and Equity in Education" aimed at improving the overall schooling quality (Avalos, 2009, p. 387). It included the establishment of professional development meetings called *microcenters*. These monthly meetings were held at a designated local school with teachers from adjacent schools also in attendance (Avalos, 2004). In these meetings, teachers discussed issues surrounding the core curriculum, shared their experiences with colleagues about difficulties they encountered, and exchanged opinions. All of these activities were carried out under the assistance of a school supervisor and invited guests (Avalos, 2005). At the end of the 1990s an external assessment of the microcenter initiative, and other professional development opportunities, showed that they contributed to 40% of schools' learning

results. These schools, in turn, saw progress over time in standardised domestic learning evaluations (Avalos, 2005).

In addition to the implementation of the microcenter initiative, Sanchez and Salinas (2008) have declared that since the early 1990s, the inclusion of technology in Chilean classrooms has been part of the government agenda. To improve schools' technological equipment, a large-scale initiative was established with the intention of providing Chilean students with quality and equal education (Sánchez & Salinas, 2008). Having this objective in mind, the Enlaces network was created with the aim of improving learning and teaching by integrating ICTs into the syllabus and thus incorporating learners and teachers into the global knowledge society (Sánchez & Salinas, 2008). Sanchez and Salinas (2008) argue further that by providing teachers and students with access to technology, the educational gap can be reduced in publicly financed schools. Since the year 1992, the Enlaces network has supplied internet access and appropriate infrastructure to public schools; professional development programs for in-service educators; and the implementation of digital resources (Sánchez & Salinas, 2008). Additionally, there has been an increase in the assessment of teacher quality in Chile. In 2005, it became mandatory for in-service teachers to be involved in the Chilean national teacher evaluation system (NTES), a process that has involved 71,000 in-service educators in the Chilean public education area (Santelices & Taut, 2011). The assessment outcomes have profound impacts for teachers, as those within the excellent and proficient level are qualified to get a salary raise, whereas the teachers with inadequate skills are asked to pursue further professional development.

Another initiative, known as the *Teacher Plus* project, undertook a thorough assessment of teaching practices on a national scale (Manzi, Preiss, Flotts, Gonzalez, & Sun, 2008). The Teacher Plus project was strengthened by the establishment of different public policy initiatives with the intent to recuperate the public perception of the teaching profession in Chile (Preiss, 2009). The Teacher Plus program operated on a conceptual framework known as the "framework for good quality teaching" (Ministerio de Educacion, 2003, p. 7). Even though this framework sets the minimum requirements for teaching in this country, it does not state clear operational definitions. As a consequence, it has been the task of Teacher Plus to elaborate evaluation guidelines that are in line with the "framework for good quality teaching" (Preiss, 2009, p. 1). The Teacher Plus program has established that good quality teaching involves focusing on the learner as the focal point of the learning process. Additionally, classroom activities should be organised around the figure of the

student with the teacher being a guide who promotes critical thinking and provides clarification when necessary (Ministerio de Educacion, 2003).

There are varied reasons behind the rationale of adopting a student-centred approach in a classroom setting. The use of a student-centred approach enables learners to be in charge of their own construction of knowledge (Shang, Shi, & Chen, 2001). This results in more meaningful learning and commitment when students are responsible for their own knowledge development (Shang, Shi, & Chen, 2001). In addition, the use of a student-centred approach results in enhanced student confidence as well as in a more interesting, exciting and meaningful learning experience (O'Neill & McMahon, 2005). In a student-centred approach to learning, students must determine the steps to follow in order to build new knowledge. This culminates in an increased sense of ownership over their whole learning process (Pedersen & Liu, 2003). Further, a student-centred approach increases student-controlled interactions with students being active participants who negotiate and articulate their ideas through engaging in a socially organized inquiry process (Pedersen & Liu, 2003). Nevertheless, and despite what has been declared by the Teacher Plus program, a student-centred approach is not widely used in Chilean classrooms (Preiss, 2009). This can be related to how folk pedagogies have influenced educational practices in Chile (Preiss, 2009).

1.2.2 Folk pedagogies

To understand the reason why Chilean teachers teach in a particular way, it is essential to complement the Teachers Plus performance-appraisal with a perspective on the teachers' folk pedagogies (Preiss, 2009). Examining teaching practices from a performance-appraisal angle identifies the strengths and weaknesses teachers may have. However, teachers' folk pedagogies link those practices both to "the cognitive dimension of teaching and its cultural background" (Preiss, 2009, p. 2). When Bruner (1973) made use of the term "folk pedagogy", he referred to "received wisdom, about what children need to learn, what teachers need to teach, how this teaching should be done and so on" (Kang, 2015, p. 267). Additionally, Bruner had observed that there are four predominant pedagogical models. The first one considers the learner as an imitator who acquires information by following the teacher's modelling and demonstrations. This model acknowledges the use of skills and expertise (Kang, 2015). The second model deems learners as individuals who can benefit from the teacher's direct instruction. Learners are given rules and facts that they learn, then apply in different contexts (Kang, 2015). The third model emphasises collaboration and dialogue as a way to gain new knowledge. By sharing and interacting

with others, and using cultural tools, learners construct new meaning (Kang, 2015). The fourth and final model regards learners as conscious individuals who are aware of the knowledge obtained from experience. In this paradigm, the teacher's role is to assist learners find the equilibrium between what they already know with the knowledge that is contained by the cultural context (Kang, 2015). Folk pedagogies can be classified into two main categories: internalist and externalist (Preiss, 2009). Further, these categories can be typified in the following four ways:

- The focal point of an internalist folk pedagogy is the *social construction of knowledge* (Preiss, 2009). This type of folk pedagogy includes elaborative dialogue that is rich in subjective data drawn from conversations (Preiss, 2009). In this type of folk pedagogy, lessons are student centred; the teacher's role is to moderate and follow-up on students' independent elaboration of ideas (Preiss, 2009).
- An internalist folk pedagogy has as a central focus the *cultural elaboration of knowledge* (Preiss, 2009). It also involves elaborative dialogue that is rich in subjective data drawn from oral exchange (Preiss, 2009). Classes are planned around a profuse dialogical format which is enhanced by constant follow-ups by the teacher. This contributes to the adjustment of students' understanding to meet the needs set by varied cultural sources and that of the teachers (Preiss, 2009).
- An *externalist folk pedagogy* is centred on content transmission or the development of the individual's abilities (Preiss, 2009). It includes extensive informative conversations and follow-ups on the part of the teacher. The class is centred on the teacher's figure because of the essential role they play in delivering content knowledge (Preiss, 2009).
- An *externalist folk pedagogy* centred on the development of skills is organised around the figure of the teacher (Preiss, 2009). In this type of folk pedagogy, the teacher has a pivotal role providing abundant supplementary information while at the same time demonstrating procedural skills (Preiss, 2009).

There are two ways to understand folk pedagogies empirically. One way is by conducting traditional interviews to probe into teachers' beliefs about folk pedagogies. Another way is through the observation of video surveys or analysing teachers' documentation to determine how folk pedagogies are manifested (Preiss, 2009). In a study on the use of video surveys to infer teachers' intuitive pedagogies conducted by Preiss, it was indicated that there were two aspects which guided the learning process to a great degree: *teacher*

talk and *lesson structure*. On the one hand, quality teaching is based on *teacher talk* that is essentially abundant in introspective and mentalistic content (Preiss, 2009). Olson and Astington (1993) hypothesised that a better understanding of students' own and others' beliefs is more prevalent in those learners whose teachers have made use of rich metacognitive talk in the classroom. Yet, mentalistic talk is not only important for understanding a person's knowledge but also to improve self-regulation (Paris & Paris, 2001). Metacognitive talk encourages students to self-reflect and assess their own output (Andrade & Perkins, 1998) which, in turn, facilitates learning a variety of content. For this reason, teachers are encouraged to foster metacognitive talk in their teaching practices in a classroom setting (Preiss, 2009).

On the other hand, *lesson structure* is regularly linked to the analysis of classroom management actions (Preiss, 2009). However, there is no direct relationship between any specific instructional approach and the use of successful classroom management strategies (Brophy, 2000). For example, in a study on lesson duration that took place in Mexico, Loera (2006) reported that the average lesson duration was 52.18 minutes. Within that timeframe, 31.62 minutes was assigned to student independent work and 20.56 minutes was devoted to teacher lecturing (Preiss, 2009). Additionally, another study on lesson structure conducted in Russia, the United Kingdom, the United States, and India by Alexander (2001) showed that lesson organisation differed due to factors such as time devoted to instructional content, and time spent on the different parts of the lesson. The study suggested that in the participating western countries, lessons had an important focus on the introduction of new material, teacher modelling, and students' independent study. In eastern countries lesson time was devoted to reading from a textbook and repeated practice of exercises contained in the textbook (Preiss, 2009). Further, in eastern countries lessons relied heavily on a single task, whereas in the case of western countries lessons included a series of different developmental tasks (Preiss, 2009).

Preiss (2009) has indicated that to assess the validity and pertinence of folk pedagogies in the Chilean educational system, it is necessary to consider two socio-cultural issues. The first issue relates to Chile's cultural background (a Spanish-speaking, mostly *mestizo* country) which shapes teaching practices in this country. He argues further that there are two attitudes toward education in Chile: an *enlightened* approach, and a *factory* approach (Preiss, 2009). The *enlightened* approach had its origins in the early 19th century when Chile was pronounced an independent country and its main goal was to construct a cultural basis for a new emerging society (Preiss, 2009). The *factory* approach emerged as

the arrival of positivism started to alter the State's attitude towards the instructional process together with the raise in enrolment in educational institutions (Preiss, 2009). Despite these differences, both of these approaches are examples of teacher-centred instructional models. In a teacher-centred approach, it is the teacher's job to motivate and prepare students to make them receptive to the knowledge being transmitted (Preiss). Further, a teacher-centred approach implies the use of conductism in the way of learning (Forment, 2007). A conductist approach focuses on the use of content which must be structured to deliver the specific knowledge the teacher wants the students to learn (Forment, 2007). Conductism suggests an accurate instructional syllabus based on concrete learning outcomes (Forment, 2007). Additionally, conductism includes the use of well-designed and planned content that is divided into small units that follow a pre-determined sequence and which are to be studied separately (Forment, 2007). Further, there is constant assessment of students' development, control of students' learning progress, and constant reinforcement of students' answers (Forment, 2007).

It is clear that both models are coherent and align with externalist folk pedagogies. The second issue raises the concern of compatibility of the local teaching context with educational theory. It has been indicated that metacognitive theories, which emphasise the importance of *thinking about thinking*, are the by-product of literate societies (Preiss, 2009). However, Chilean and Latin American societies are dominantly oral rather than literate (Preiss, 2009). A pre-eminent feature of oral societies is that they do not "go meta"; in other words they do not consider mind or language as objects for further analysis (Preiss, 2009). As a result, it may be the use of the predominant cultural patterns which has resulted in a deficit in the use of metacognition in the teaching process, rather than attributing this insufficiency to teaching practices themselves (Preiss, 2009).

Considering the characteristics of an externalist folk pedagogy, and the strong influence that cultural traditions have in Chilean education, it is reasonable to conclude that Chilean teachers continue to utilise a teacher-centred model of teaching (Preiss, 2009). As a result, there is evidence to suggest that the use of teacher-centred discourse is widespread, including informative talks and constant follow-up assessment in lessons that are structured around the figure of the teacher (Preiss, 2009). This is evidenced in a video analysis study conducted within the Teacher Plus program in which the teacher's role within lesson organisation was evident in questioning (Preiss, 2009). Student contributions additionally aligned with this teacher-centred pedagogical approach. This study revealed a teaching model based on the intuitive pedagogies used by Chilean teachers, which are

founded in the pedagogical models that have formed the national educational system (Preiss, 2009). Hence, this teacher-centred educational format results in students having a passive role during the learning process. In this context, the learning process can be understood as information delivery and mere student 'training' with a lack of shared responsibility between both participants (Haye & Pacheco, 1995). Additionally, the teachers' role in this model is viewed as that of controlling and guiding the students. Under this paradigm, when the student 'deviates' from the norm, the teacher has to make sure that they follow the guidelines that have been indicated (Edwards, Assael, & Lopez, 1991). This results in a unilateral and restrictive educational model for both teachers and students (Weinstein, 1991).

The use of stories and narrative has a pivotal role in Bruner's folk pedagogy (Kang, 2015). Further, telling stories about others and ourselves is the earliest form used to organise knowledge and experience (Bakhurst & Shanker, 2001). Children's intellectual development takes place amongst narratives that are used in familiar contexts which results in the construction of new realities and making sense of the surrounding world (Bakhurst & Shanker, 2001). The use of narratives has been characterised as an essential element in cognitive development (Bruner, 2006). From an early age, children are exposed to dialogical interactions with adults. The child's capacity to understand those conversations and guide them occurs when independent thinking takes place (Bruner, 2006). Similarly, the educational process is based on dialogues and conversations with teachers. These conversations, in turn, lead the student to develop specific skills and internalise the rules that generate that conversation so that the learner can guide those dialogues himself (Bruner, 2006). Further, Bakhurst and Shanker (2001) have observed that the most important element of the educational process is the constant exposure that learners have to a variety of narratives and stories, whether these happen formally in the classroom or outside. The educational process involves learners getting to understand how the world works based on all the narratives that they can experience in and out of school (Bakhurst & Shanker, 2001).

The use of informal narratives to construct knowledge and the world that surrounds the individual is what vernacular pedagogies comprehend. Vernacular learning is the result of local theories of understanding that are developed within community and family settings (Pickford, 2008). Further, vernacular pedagogies result in a more extensive set of points of reference and contexts being recalled than those being present in a lesson. Hence, it can be suggested that social or cultural models exert a great influence in teaching patterns

(Pickford, 2008). Vernacular learning is based on familiar and communal understandings which relate to pre-service teachers' beliefs about teaching being analogous to what has been called apprenticeship of observation (Lortie, 1975). In a pre-service teacher context, apprenticeship of observation describes students who start their studies having many hours assessing and observing in-service teachers (unlike novice doctors or lawyers) (Borg, 2004). Further, this apprenticeship process is responsible for a variety of assumptions that teacher trainees have about the educational process (Borg, 2004). Considering that most of these teaching observations are unexamined on the part of the pre-service teachers, they constitute "folkways of teaching" (Borg, 2004, p. 274). Further, Buchmann (1987) has pointed out that folkways of teaching turn into "ready-made recipes for action and interpretation that do not require testing or analysis because they promise familiar, safe results in normal situations" (Buchmann, 1987, pp. 12-13). The use of an apprenticeship of observation results in "teachers teach[ing] the way they were taught" (Mewborn & Tyminski, 2006, p. 30). Further, this apprenticeship of observation practice has been considered the reason why teacher development programs do not have the desired effect on educators' practices and beliefs (Mewborn & Tyminski, 2006). If teacher trainees were involuntarily exposed to an apprenticeship by observing other teachers, they were on the receiving end and unaware of educators' reflections and reasons and only noticing the lecturer's final actions (Mewborn & Tyminski, 2006).

The apprenticeship model of observation that occurs in Chilean classrooms influences future teachers' practices and indirectly results in a lack of development in learning and teaching skills. This has triggered the necessity to modernise and innovate educational practices in Chilean education by introducing a constructivist and cooperative approach to learning (Avalos, 2004). Cooperative learning has been proven to be more productive in terms of knowledge gain than individualistic or competitive approaches (Johnson, Johnson, & Stanne, 2000) as it has produced higher academic outcomes, enhanced critical thinking and social skills (Brandon & Hollingshead, 1999; Cheng & Warren, 2000; Foley & O'Donnell, 2002). Research presents substantial evidence to suggest that the use of a cooperative approach for learning boosts the rate of achievement more than individualistic and competitive approaches (Johnson et al., 2000). Nonetheless, the use of a cooperative approach to learning appears to be mostly unknown and unpractised in the Chilean educational context. This is due to the strong cultural traditions upon which the Chilean educational model is based and the teacher-centred model of education they support (Preiss, 2009).

1.3 Aims and rationale for the study

This study aimed at exploring Chilean pre-service English teachers' perceptions of cooperative learning in a face-to-face context and the 3D VW of Second Life. There is a general lack of research that examines perceptions of cooperation and its effectiveness and validation in an online medium (Kupczynski, Mundy, Goswami, & Meling, 2012b). It was important to understand if cooperative learning contributes to improved pre-service teacher preparation, regardless of the type of environment in which it was implemented. The content to be learnt was chosen with the purpose of expanding pre-service teachers' knowledge and awareness of Australian historical events and geographical information covering two topics: the "Sydney Opera House" and "Uluru"; two of Australia's iconic landmarks. Based on these topics, two learning units were developed. In the Chilean context, The United States of America and England are the two countries that have a marked presence in the media and newspapers. The need to focus on Australia was the result of discussion with university teachers from where the sample was obtained and their desire to change and expand these trainee teachers' knowledge of a different English speaking country other than the ones previously mentioned. Another reason why Australia was chosen as the focus of inquiry was related to the textbook students were using at the time, "History and language of English speaking countries", which included a lot of information about Australia as an instructional topic. Finally, and after exploring the different islands that are made available and free to use in Second Life, there was already a fully developed one that recreated and contained information on Uluru and the Sydney Opera House. Taking into consideration that developing a whole island from scratch in the Second Life environment is costly and takes time, this one was perfect to meet the need that had arisen.

1.4 Significance of the study

"There is a dearth of research describing virtual technologies used to augment field experiences for pre-service special education teachers" (Billingsley & Scheuermann, 2014, p. 268). Additionally, the use of cooperative learning in a face-to-face and 3D VEs in the Chilean pre-service teacher educational context needs to be analysed since, in general, there is a paucity of studies that focus on how cooperation is supported by technology (Razmerita & Kirchner, 2015). Further, exploring learners' perceptions towards the inclusion of technology assisted learning requires further exploration (Venkatesh, Croteau, & Rabah, 2014). In the present study, the implementation of cooperative learning in two types of environments in the Chilean educational context aimed at clarifying whether this

approach is accepted by both pre-service teachers and in-service practitioners. Further, exploring the difference in the establishment of a cooperative approach to learning in two different contexts was analysed by means of a Cooperative Learning Questionnaire and a forty-item test that was specifically designed to assess learning from the two units. The effectiveness in using a face-to-face and a VW environment to learn was examined as well as students' perceptions of the teachers and their effect on learning.

Additionally, and based on the data collected and analysed, a framework was proposed which combines elements from the five-stage online learning model proposed by Salmon (2011), structured cooperative group elements by Gillies (2007), and scaffolding components proposed by Hannafin, Land and Oliver (1983) and Roehler and Cantlon (1997). Its utilisation could prove to be helpful to effectively implement cooperative learning in VWs.

1.5 Thesis structure

This thesis is composed of seven different chapters. Chapter 1 covers the aims and rationale of the study, together with the research questions that guided the study. Additionally, the Chilean educational context, the cultural background that shaped it, and the efforts that the government has undergone to improve its flaws are reviewed. Chapter 2 comprises the literature review. The development and history of VWs is covered as well as the VW of Second Life for learning and the learning styles it appeals to are also included. Salmon's (2011) model and the community of inquiry (CoI) model developed by Garrison, Anderson, and Archer (2000) are presented. The key elements of successful cooperation are also presented in this chapter. Chapter 3 presents a review of the theories that underpinned this study. Vygotsky's (1978) theory of social constructivism and the zone of proximal development (ZPD) are revised. Additionally, scaffolding and learning within the ZPD are also addressed. The theory of social interdependence proposed by Johnson and Johnson (1989) and Piaget's (1952) cognitive development theory are also addressed. The chapter finishes with the inclusion and explanation of Siemen's (2004) connectivist theory. Chapter 4 discusses the research methods. It describes the types of instruments and the methods used to collect the data. It also addresses the way in which the samples and data were obtained and how these data were analysed.

Chapter 5 presents the results section of the thesis. It includes the two embedded case studies and the quantitative data analysis. The first case study describes the case of Mr "J" and Miss "A", the student and the teacher working in the VW of Second Life respectively. It

describes how working cooperatively changed their views on learning and teaching and the role that Second Life played in enhancing the experience. The second case study describes the case of Mr “R” and Miss “V”. This case study describes how cooperative work helped Mr R to overcome his social aversion to working with others. Additionally, Miss V’s case is presented and discusses how cooperative learning contributed to improving her teaching. In both cases, the roles of feedback and scaffolding are addressed and explained. In addition to the case studies, there is the statistical analysis section presenting the Cooperative Learning Questionnaire and the achievement test results.

Chapter 6 is the discussion chapter. It addresses the face-to-face and virtual groups’ perceptions of cooperative work. It also answers the research questions based on the quantitative and qualitative information. Further, it discusses cooperative work implementation issues in both types of environments as well as the contributions to the present study. Finally, Chapter 7, the conclusion, draws together the main findings of this study. It also addresses the limitations and future research directions based on the findings.

2. Literature Review

This chapter presents a review of the literature that delineated this study. It begins with a review of the topic of VWs and their development based on technological advances. Further, it describes the technical aspects that facilitated VW developments and widespread use. Additionally, the use of Second Life for learning and the different types of educational experiences that can take place in this type of environment are also described. It addresses the issues of participants assuming different roles and experiences in different scenarios for learning as well as the role of feedback and its importance for learning. The use of Second Life to promote distributed learning and how it can influence different learning styles are aspects that are also covered in this chapter outlining research conducted in those areas.

In addition to the above, the five-stage model proposed by Salmon (2011) for teaching and learning online is presented and explained. Covered is not only this model's advantages, but also criticisms and concerns raised by some researchers about this framework. Additionally, the Community of Inquiry (CoI) model with its three components is presented. The explanation of how the intertwinement of social, cognitive, and teaching presences create the optimal environment for online learning to take place is clarified. Its limitations are also addressed in this chapter. This helped to provide a thorough understanding of the reasons why teachers follow certain practices in the classroom. It also helped to clarify the reason why a student-centred approach was welcomed by these pre-service teachers. Finally, the inclusion of cooperative learning is explained. A description of its five basic constituents and how they are necessary to facilitate learning is made clear.

2.1 Virtual worlds

The phenomenon of VWs in education has been widely considered (Duncan, Miller, & Jiang, 2012; Mathews, Andrews, & Luck, 2012; O'Connell & Groom, 2010) and it has been argued that the use of technological tools has become a pivotal element when it comes to educational development (Esteves, Fonseca, Morgado, & Martins, 2011). Research has suggested that technology permits the transformation of the teaching and learning processes creating new possibilities at higher education level (Esteves et al., 2011). Further, the use of VWs for instruction is in an embryonic stage with Second Life being one the most well-known and developed environments used with this intention (Duncan et al., 2012).

It has been proposed that the definition of what VWs are remains disputed despite their existence since the early 1980s (Sanchez, 2009). However, Koutsabasis, Vosinakis, Malisova, and Paparounas (2012) have established that VWs are “computer-generated, persistent 3-D environments in which users co-exist as avatars exploring, building, interacting and communicating” (p. 357).

From an educational point of view, there is a developing interest in relation to the design of appropriate platforms and tools within VWs (Koutsabasis et al., 2012) and it is proposed that the use of targeted challenges, clear tasks and objectives, feedback, and interaction assist in the creation of an efficient learning environment (Luo, Cao, Yang, Liu, & Ye, 2011). Annetta, Folta, and Klesath (2010) have suggested that “designing virtual learning environments is not merely a matter of getting the curricular material right, but also a crucial matter of getting the situated, emergent community structures and practices in place” (p. 26). Despite these claims, no final agreement has been reached in terms of what an efficient design comprises since the use of novel technologies constantly influences existing practices (Koutsabasis et al., 2012). Even though there is lack of agreement associated with VW design, Chang, Hwang, Chen, and Muller (2011) proposed that the use of multimedia, computer graphics, and virtual reality can provide a fresh perspective for learning. Additionally, according to Keser and Özcan (2011) technology and related tools are the future for education since they enable the creation of attractive learning settings that promote the construction of new knowledge.

Nevertheless, Ernest, Heiser and Murphy (2013) have recommended that it is important to provide pre-service teachers with the necessary training and tools to exploit these environments appropriately before their actual use in the classroom. Further, these researchers indicated that pre-service teachers may not be equipped to adjust to the varied instructional roles which are required to fulfil or to support and develop cooperative work in VWs (Ernest et al., 2013). Gregory, Dalgarno, Campbell, Reiners, Knox and Masters (2011) have explored the use of virtual environments in pre-service teacher education. These authors have pointed out that numerous pre-service teachers commence working not having enough knowledge and tools to confidently manage unexpected teaching conditions. In a study conducted by Gregory et al. (2011), the researchers explored 72 pre-service teachers’ practices when engaged in a role-play situation in a VW. Gregory et al. concluded that using VWs helped to both supplement pre-service teachers’ learning and engage in active preparation for practice in real contexts. The researchers have suggested that according to research not only in Australia but also in other countries,

pre-service teachers start work having inadequate tools and experience to teach successfully (Gregory et al., 2011). They have also claimed that it is this lack of preparation which is partly responsible for pre-service teachers' attrition rates at early stages in their professional lives (Gregory et al., 2011).

Simonson, Smaldino, and Zvacek (2015) have observed that an online educational experience differs from online gaming. Additionally, Salmon (2011) asserted that the difference between online gaming and learning is that "unlike social networking of all kinds, casual browsing or playing games on the web, a key distinction of online education and training is that they are highly purposeful and have planned goals, outcomes and directions" (p. 12). The distinction between what online gaming and the use of Second Life for online learning was the difference that students perceived as a result of the research conducted. However, to fully employ an online environment, whether working in a blended mode or from remote locations, teachers need to thoroughly evaluate and consider all the different activities and aspects that contribute to meet the learners' needs (Salmon, 2011). Careful structuring of the classes, sequential use of activities and awareness of the environment's potential is necessary to meet the proposed course objectives (Salmon, 2011). However, and despite the interest that teachers may have to boost the use of virtual environments to establish cooperative learning activities, they may not have the appropriate skills necessary to accomplish this successfully (Hopkins et al., 2013).

2.1.1 The development of virtual worlds

It has been indicated that there is a considerable succession of events in the development of virtual learning environments with computer-based courses being offered as early as the 1960s (Duncan et al., 2012). However, it was not until the 1980s and 1990s that technological advances permitted the creation of what is currently known as internet-based media (Duncan et al., 2012). In summarising the development of VWs, there are five stages to be acknowledged (Sanchez, 2009, p. 9), namely:

- Multi-User Dungeons (MUDs);
- TinyMUDs;
- MOOs (Multi-user dungeons Object Orientated);
- MMORPGs (Massively Multiplayer Online Role-Playing Games);
- 3D social VWs.

Early MUDs were text-based, interactive VWs where participants interacted via text-based commands. The recurring theme in most of the first MUDs was either medieval or fantasy,

displaying adventure quests and combats (O'Connell & Groom, 2010). After the favourable acceptance and evolution of MUDs, the second milestone, namely, TinyMUDs, added a social element to the VW's experience (O'Connell & Groom, 2010). The difference between the early MUDs and TinyMUDs was that the former revolved around adventure and combat, while the latter had a social component as its main theme (Sanchez, 2009). TinyMUDs enabled participants to create new objects and game elements from within the game which resulted in the creation of a new relationship between players and the game (Sanchez, 2009). Unfortunately, the technological restrictions of the time allowed players to construct elements that could not be manipulated but only observed by the other players (Sanchez, 2009). Sanchez (2009) contended that the creation of TinyMUDs represented the transition from VWs as spaces mainly for gaming activities to spaces for socialisation. He further argued that with the creation of TinyMUDs "creativity and collaboration began to have a place in VWs, along with the traditional elements of combat and competition" (Sanchez, 2009, p. 10).

The next stage in the development of VWs witnessed the evolution of MOOs: environments where users had the possibility to create new elements within the environment itself and give them to other participants so that they could interact with those new items (Sanchez, 2009). One key feature of MOO environments was their easy-to-learn programming language, hence their popularity amongst players and eventual use as educational tools (Sanchez, 2009). Additionally, MOO environments allow different types of interaction to take place, namely, interaction among students; between students and the environment; and between students and software agents (Slator, 2006).

The emergence of MMORPGs constituted the next stage in the development of VWs. In these persistent worlds, users interact with other players inside an online graphical world where they adopt a new role while trying to fulfil a task or accomplish a specific goal (Sanchez, 2009). In this context, persistent means that these online universes can change, develop, and exist even when users are offline (O'Connell & Groom, 2010). Further, MMORPGs facilitate immersion and that the use of avatars allow learners to communicate and interact with peers through the use of gestures and chat tools (Peterson, 2012). Immersion has been defined as "the subjective impression that one is participating in a comprehensive realistic experience" (Dede, 2009, p. 66). Immersion results in enhanced engagement (Robbins, 2007), and supported flow (Csikszentmihalyi, Kolo, & Baur, 2004). In addition, immersion contributes to the development of collaborative group work as well as the emergence and inspection of new identities (McKerlich & Anderson, 2007).

Immersion in the Second Life environment can be explained by what Warburton (2009) refers to as presence layers. The 3 layers proposed by Warburton indicated that it is the visual and physical authenticity that Second Life incorporates to the environment which results in users having a deep sense of immersion and co-presence when other avatars are nearby. The physical layer involves visual closeness which is achieved by the use of the camera component in Second Life. The communication layer is achieved due to the employment of the voice chat. Finally, the status layer involves in and out world members contact (see Figure 2.1):

Layer	Description	Tool
Physical layer	Visual proximity	Camera POV
	Physical proximity: location	Mini map, region map
Communication layer	Synchronous: spatially aware	Voice and local chat
	Synchronous: distant	Instant message
	Asynchronous	Group notice, IM to email
Status layer	In world	Contacts on/off line
	Out of world	SL friends online

Figure 2.1 Presence layers in Second Life (Warburton, 2009, p. 420)

In MMORPGs environments, the interaction and collaboration takes place through an avatar: a visual representation of real or artificial intelligence in the VW (Van Lun, 2011). In these environments, and as a result of the permanent contact with others, users develop significant relationships and emotional experiences that lead them to favour interacting with people within the environment rather than those in real contexts (Kuss & Griffiths, 2012). Additionally, and according to King (2008), interactions have been shown to boost varied types of learning outcomes, thus being helpful to develop different cooperative educational tasks. Further, from a socio-cognitive learning theory perspective interactions with peers have a strong impact in cognitive development and change (King, 2008). Sanchez (2009) has established that there were three key elements, based on the use of MMORPGs, that facilitated the emergence of 3D VWs, namely:

“[T]he dependence on collaboration within MMORPGs which created a strong social system”;
 ”players supported and sustained the social systems outside of game play, usually with web

pages and bulletin boards”; and “the emergence of residential broadband internet connections and high-end personal computers created an entry point for nongamers to enter virtual world environments” (p. 34).

Even more, according to Sanchez (2009), the VWs of Second Life, There, and Active Worlds are three environments that have succeeded since 2003. The researcher claimed that these worlds are different from MMORPGs in the sense that they do not revolve around a gaming activity (Sanchez, 2009). Users or *residents* in these 3D VWs socialise, design, build and collaborate as opposed to engage in combats or quests (Sanchez, 2009). Additionally, many residents manage their own enterprise in the VWs of There and Second Life as it is possible to sell a wide variety of items ranging from clothing to vehicles (Sanchez, 2009).

3D graphical virtual environments such as Second Life provide the possibility to learn as if being present and that is the reason why they have gained popularity (Robertson & Cargill-Kipar, 2010). Additionally, the principles of learning by exploring and collaborating are important in Second Life (Lim, 2009). The first one, *learning by exploring*, involves visiting simulations and possibly including inferential analytical tasks. The second one, *learning by collaborating*, involves learners working and learning together or in a group using problem solving and discussion-based inquiry.

Johnson, Adams Becker, Estrada, and Freeman (2015) argue that the use of technologically enhanced environments promotes active learning workspaces that are student-centred and which promote dialogic interactions and problem solving while the teacher only acts as a facilitator. This suggested that Second Life’s graphical nature permits users to feel social presence which in turn supports cooperative work allowing group participants to experience a sense of community and be connected to one another (Robertson & Cargill-Kipar, 2010). Additionally, Imlawi and Gregg (2014) claimed that virtual environments are appropriate places to promote student engagement within a community. It has been indicated that VWs are deeply engaging environments with three dominant characteristics, namely: they are not a game in the sense that there is no enforced competition; an avatar enables graphical exploration by allowing the user to move around the VW space; and users and designers can build new areas within the environment (McKerlich, Riis, Anderson, & Eastman, 2011). In addition to those features, there are another six, namely: (1) the existence of a graphical user interface (GUI); (2) interaction takes place synchronously; (3) users can communicate simultaneously; (4) the world still exists when users are not connected (Book, 2004). Further, VWs are (5)

interactive in the sense that users can alter and build within these spaces; and they (6) foster the formation of communities in-world (Book, 2004). According to McKerlich, Riis, Anderson and Eastman (2011) VWs are considered a developing educational technology with the capability to “create rich sense of presence, ready construction of and contribution to learning activities and transparent visibility to “adjacent possibilities” (p. 325).

It has also been proposed that learners build more meaningful knowledge when they actively interact with materials, tools and information within a collaborative and reflective learning environment (Dickey, 2011). This sense of community developed within the Second Life environment and its enticing nature prevent learners from feeling either frustrated or bored, hence experiencing flow: a sense of satisfactory mental state and clarity (Barata, Gama, Jorge, & Gonçalves, 2015). However, and despite the fact that teachers may be keen to make use of the affordances of virtual environments, they may lack experience and confidence in assisting the development of collaborative learning in these types of environments (Ernest et al., 2013). Hence, it is necessary to assist teachers to develop their awareness of the importance of collaboration and establish the appropriate settings to exploit technological advances (Ernest et al., 2013). Stendal and Balandin (2015) have observed that “virtual worlds such as Second Life offer the possibility for communication, social interaction, and economic exchange among users who are represented virtually by their avatars” (p. 1592). In addition, it had been previously identified that Second Life and Active worlds were two of the most popular VWs due to the opportunities they offer to develop interactive settings for constructive learning (Dickey, 2011). Further, Maher and Gu (2014) contended that Second Life and Active worlds enable users to connect with other virtual spaces via hyperlinks. Therefore, if a constructivist-based learning approach is taken into consideration, virtual platforms enable collaborative and inquiry-seeking learning to be more effective by providing easy access to varied learning resources (JungJoo, 2011).

2.1.2 Second Life for learning

Since Linden Lab launched to the public Second Life in 2003, there has been a progressive number of users signing up for this virtual platform currently reaching more than 300 million residents who are official members (Duncan et al., 2012). Furthermore, Zhou, Jin, Fang, and Vogel (2015) have established that there are millions of registered accounts on Second Life and that, at any given time of the day, there are up to 30,000 users online totalling more than 20 million user hours monthly. Subsequent to its reinauguration in the year 2004, researchers have established that there is an increased

interest in using VWs, especially Second Life, as a technological help for teaching (Duncan et al., 2012). Further, the considerable number of users who are actively using Second Life constitute an important source of information for academic research (Zhou et al., 2015).

At present, teachers are showing an increased interest in the inclusion of technological tools to assist teaching and enhance students' learning experience (de Ribaupierre et al., 2014). The first text-based virtual environments created in 1979 have kept on progressing and attracting a more demanding technology savvy audience (Sanchez, 2009). 3D immersive VWs allow learners to "touch" and manipulate items in a virtual universe (Childs & Peachey, 2013). Additionally, Childs and Peachey (2013) have declared that in spite of the existence of different virtual platforms, most educators still use Second Life as their preferred one for educational purposes. In addition to that, VWs' graphic nature allows participants the opportunity to interact with millions of users and at the same time they receive prompt feedback (Sanchez, 2009). Even more, in a virtual environment setting, participants have the choice to adopt particular different roles and personalities and accomplish specific tasks when performing those roles (Childs & Peachey, 2013). Billingsley and Scheuermann (2014) have proposed that the use of virtual simulations with instructional purposes seems to be a promissory element in pre-service teacher's programs to develop confidence and capability before actual in-service teaching.

Second Life is a unique place that allows learners to expose themselves in situations or contexts that would be impossible for them to experience in real life such as visiting Mars or exploring the human body's circulatory system (Simonson et al., 2015). The popularity of Second Life had resulted in more varied uses for this platform with categories ranging from social community, business, to education (Duncan et al., 2012). Examples of these are the Second Life Music community, the Intel Corporation, and the Education UK Island, where it is possible to learn new skills, a language, or train medical skills (Duncan et al., 2012). Further, it is the flexibility of the Second Life environment to cater for different areas which makes it highly appreciated by its users (Wilks & Jacka, 2013). In-world it is possible for users to build entire buildings and islands from scratch; build specific means of transportations; own real estate; and customise and dress their avatars. These features have contributed to situate Second Life as a popular and sophisticated 3D virtual environment (Wang & Burton, 2013). Reports on virtual environments have proposed that these settings trigger students' motivation in learning activities to achieve desired outcomes (Chau et al., 2013). Capanni and Doolan's (2011) assertion is that the inclusion

of virtual environments in the learning process fosters students' engagement with the content, and the flexibility to advance at the students' own speed in their free time. However, learning at their own pace does not only presuppose catering for "slow" students' needs, but also fast learners' ones. Nowadays, "digital native" students are less patient with the current formal, structured educational system (Bennett & Peachey, 2007). Further, digital natives think, play and learn in dynamic contexts which are multimodal, digital, interactive, and include a variety of media (Konstantinidis, Tsiatsos, Demetriadis, & Pomportsis, 2011). The researchers argue further that in these environments, participants have expectations of being constantly engaged and motivated by content production (Konstantinidis et al., 2011).

It is the affordances of 3D virtual environments like Second Life to add a heightened sense of reality which result in an increased student engagement in learning. This is due to the fact that Second Life can replicate real environments with more realism than do two-dimensional or text-based settings (Chau et al., 2013). Furthermore, according to the researchers VWs are permanent environments where participants can interact with others, having a sense of being with them (Chau et al., 2013). Regardless of the benefits of using VWs with educational purposes, there is a dearth of studies that show the benefits of using these kinds of environments in pre-service teachers programs (Billingsley & Scheuermann, 2014). In a review of the literature, only 21 theoretical and empirical articles have been found on the use of VWs for teacher education (Oh & Nussli, 2014). Further, it has been proposed that teachers should be made knowledgeable about the uses and benefits of VWs as learning environments (Merchant, Goetz, Cifuentes, Keeney-Kennicutt, & Davis, 2014). This idea has been reinforced by Garland, Vasquez III and Pearl (2012) who have observed that further research is needed in relation to virtual learning platforms and their added benefits for learning. Additionally, the use of virtual reality representations does not have a widespread use in teacher-training programs, which results in the underuse of this type of technology for teacher educators (Billingsley & Scheuermann, 2014). Nussli, Oh and McCandless (2014) argue there are insufficient empirical studies in relation to providing teachers with the necessary skills to incorporate 3D VWs in their future teaching practices. Also, it has been asserted that not enough systematic attempts have been made to provide teachers with skills in preparing VWs for class development (Guzzetti & Stokrocki, 2013).

Levy (2014) has observed, however, that regardless of the popularity of Second Life as an educational platform its popularity has recently decreased. What, once, was a thriving

space with around 1,400 companies using it to administer development programs or hold meetings, has gradually lost popularity (Levy, 2014). Nevertheless, and in spite of these discouraging developments, as many as a million users still log on to Second Life (Levy, 2014). The author states further that the change has been related to a decline in media attention and expectations (Levy, 2014).

In spite of Second Life's devolution, environment users still experience a sense of novelty, as in the study on undergraduate nurses getting ready to move to a real hospital setting conducted by Halfer and Rosenheck (2014). Participants in this study expressed that the learning experience in Second Life minimised the apprehensions of moving to real contexts (Halfer & Rosenheck, 2014). Novel educational tools stimulate better communication and collaboration channels which create the appropriate setting for students to learn (Chau et al., 2013). Second Life has been characterised as an engaging and novel instrument to boost motivation, learning, as well as collaboration (Nussli et al., 2014). Novelty is an essential ability of people to process new information in order to increase their knowledge about their own environment (Grandjean & Peters, 2011). Further, Grandjean and Peters note that there are four major kinds of novelty processes, namely: *perceptual*, *partial*, *contextual*, and *semantic*. Perceptual novelty operations are those relating to the spatial appearance of objects. Contextual novelty refers to known objects occurring in unusual situations. Additionally, the type of technology used to host a virtual learning community can ease the solution of problems, knowledge construction and sharing, as well as enabling the provision of prompt feedback when necessary (Lockee & Bond, 2014).

2.1.3 Feedback for learning

Feedback helps reduce "the gap" and "the distance between where the student 'is' and where he or she is 'meant to be'" (William, 2011, p. 122). Feedback contributes to increasing student motivation, with Hattie and Timperley (2007) claiming that motivated students invest more effort in the task. According to Hattie (2012) feedback can be supplied in the form of: validating and restructuring student's understandings; using affective processes; and expressing the need for and availability of more information. Hattie and Timperley's (2007) theoretical model of feedback (see Table 2.1) operates at four levels (task, process, self-regulatory and self) with three feedback questions being addressed: Where am I going? How am I going? Where to next?

Table 2.1 The feedback levels and questions (Hattie, 2012, p. 130).

Levels	Major questions	Three feedback questions
1 Task	How well has the task been performed?	Where am I going? What are my goals?
2 Process	What are the strategies needed to perform the task?	How am I going? What progress is being made towards the goal?
3 Self-regulation	What is the conditional knowledge and understanding needed to know what you are doing?	Where to next? What activities need to be undertaken next to make better progress?
4 Self	Personal evaluation and affect about the learning	



This first feedback question, “*Where am I going?*”, focuses on the key components of clarity, learning intentions, aims and objectives, commitment, and challenge (Hattie, 2012). The main idea is that not only the teacher should know and create these elements, but also the students should be fully aware of their existence. Instructors have to be familiar with the goals of the lesson and communicate those to students, thus highlighting the importance of learning intentions and criteria to succeed (Hattie, 2012). Including an attainable challenge component is important as participants feel motivated to persevere and reach newly-set goals; this helps create the appropriate environment for continuous learning (Hattie, 2012).

The second feedback question, “*How am I going?*” emphasises the notion of progress (Hattie, 2012). Progress feedback is offered regarding participants’ previous work, expected performance, and failure or success considering specific parts of the task (Hattie, 2012). In addition, William and Thompson (2008) argue that there are five strategies relative to this question that can be used in this phase to make learning more efficient and effective. These key strategies include stimulating students to become one another’s instructional resources; planning effective students’ class discussions that attest to promoting learning; triggering in students control over their own learning; clarifying and communicating learning intentions as well as minimum standards for success; and supplying feedback that helps learners move forward (William & Thompson, 2008).

The third feedback question, “*Where to next?*” helps students to select their immediate most suitable challenge; it can also assist in the development of students’ self-regulation over the whole learning process (Hattie, 2012). Further, this type of feedback enhances students’ ability to learn a variety of strategies to not only work on the different tasks but also gain a deeper awareness of what is and what is not understood (Hattie, 2012).

Hattie (2012) asserts that those three feedback questions work at four levels of feedback with those levels corresponding to phases of learning which range from novice, through proficient, to advanced. He argues further that the first feedback level, termed “corrective feedback,” is related to the *task and product* level. Corrective feedback is provided in relation to students’ specific assignments, hence not generalisable to other contexts. Further, corrective feedback involves indicating if responses are correct or incorrect and it provides information relevant to the task (Hattie, 2012). Whilst task and product feedback often lead to the development of surface knowledge, corrective feedback can be used as a platform upon which effective self-regulation and processing can be developed (Hattie,2012).

The second feedback level, *process* feedback, is provided in the form of questions and it is aimed at helping with task completion. This type of feedback allows the learner to improve his or her use of learning strategies and error correction, and diminish the amount of mental effort or cognitive load while working (Hattie, 2012). Additionally, it supplies alternative processing providing hints to search for more information recognising relationships between ideas and employing task strategies (Hattie, 2012).

The third level of feedback is aimed at student’s *self-regulation*. Hattie (2012) argues that this type of feedback is useful to enhance students’ confidence to get more involved with the task; and boost their abilities to self-evaluate their progress. Further, it helps students be receptive to and look for feedback and improve the learner’s decision to look for feedback and deal with it (Hattie, 2012). Additionally, he also argues that feedback can be used more effectively when students have developed the skill to supervise and self-regulate their own learning. This contributes to minimise the difference between the moment where students are in the learning process and what is expected of them as part of their learning (Hattie, 2012).

The final feedback level addresses the “*self*” and it includes the notion of “praise” (Hattie, 2012). The use of constant praise contributes to make the learner feel at ease and taken care of, it is expected and well received by students and it is habitual in classroom

environments (Hattie, 2012). One drawback, however, in using this type of feedback is the diversion from the task being dealt with; self-regulation; or process. This is why feedback about learning and praise should not be provided simultaneously (Hattie, 2012).

The use of technological tools can facilitate teachers' provision of prompt feedback to improve the learning process (Venkatesh et al., 2014). However, the use of feedback in virtual learning environments is not well documented (Merchant et al., 2014). Further, there is paucity of research on studies that report on the types of feedback supplied during virtual reality-based education (Merchant et al., 2014).

2.1.4 Learning styles and Second Life

A learning style refers to “[an] individual’s approaches or preferences in receiving, processing, and understanding new information” (Cheng, 2014, p. 106). According to Hauptman and Cohen (2011) the different ways in which learners face the instructional process can be explained through what is termed a learning style. From a Neuro-Linguistic Programming (NLP) perspective, there are three predominant styles which have been identified, namely, visual, auditory, and kinaesthetic (Fleming, 2001).

A learning style conveys the learner’s personal choices in regards to the three types of learning activities and their interconnections (Hauptman & Cohen, 2011). The three learning categories that are closely connected to the teaching process are:

- 1) Visual learning style: This type of style is prominent in those learners who prefer to watch factual data they are being presented with. It may involve the use of flow charts, information on maps, spider diagrams and other tools that present written information visually (Hauptman & Cohen, 2011).
- 2) Auditory learning style: These learners prefer to listen to spoken explanations, guidance and instructions (Hauptman & Cohen, 2011).
- 3) Kinesthetic learning style: This type of style describes those learners who learn through concrete occurrence of events (Grabowski & Jonassen, 1993). It involves haptic interaction with objects to obtain information adequately (Hauptman & Cohen, 2011).

Additionally, in a study on the development of a questionnaire to evaluate metacognitive patterns of students enrolled in an accounting program at university level conducted by Brown (2006), he proposed that there are visual, auditory, kinaesthetic, and auditory digital learners. Visual learners create mental images of the content being learned and that

auditory learners prefer to talk or listen to what is being said (Brown, 2006). Further, kinaesthetic learners learn best when they can be in contact with the physical world surrounding them, and auditory digital learners think by discussing problems in their heads (Brown, 2006). These categories proposed by Brown expanded the strategy categories that students make use of when learning and when faced with novel material.

It has been affirmed that Second Life is an ideal environment to accommodate the varied learning styles that learners may make use of when learning (Cheng, 2014). In addition, Second Life can satisfy educational requirements due to its capacity to heighten immersion and presence as a result of its intense visualization component (Cheng, 2014). Findings of a study conducted in River City (a multiuser virtual environment) showed that immersive simulation enabled students to gain substantial knowledge and skills through this type of delivery than through conventional instruction (Dede, 2009). Results in this study showed that this type of syllabus resulted in students' profound engagement which was reflected in their use of advanced problem-finding abilities; symbolic and physical immersion when compared with an identical paper-based syllabus (Dede, 2009). The researcher states further that regardless of students' gender, English language level, and ethnicity, they all learned more and were deeply engaged due to the immersive interface (Dede, 2009). Further, Second Life has many advantages such as enabling experimentation that is not possible in real contexts; offering the possibility to change identities and roles; and facilitating the possibility to increase the presence component, trust, and a sense of community online (Savin-Baden, 2011).

Hauptman and Cohen (2011) have established that virtual environments allow participants to make use of their different senses simultaneously with a noticeable visual prevalence which favours visual learners. Indeed, virtual spaces can offer a concrete representation of theoretical concepts enabling students to walk on or zoom in on geometrical objects, for example (Hauptman & Cohen, 2011). Further, and in regards to the sensory-intuitive area, virtual environments facilitate students relating abstract concepts to 'real' situations as they are worlds where 'efficiency' can become something tangible and concrete (Hauptman & Cohen, 2011). It is the first-person experience type of learning that can be supported by VWs, which enable learners to control their own learning and materialise ideas by means of the virtual representations (Lee, Wong, & Fung, 2010).

Virtual environments have distinctive characteristics, namely: highly colourful; provide the user with an immersive experience; appeal to the user's senses; visually oriented; enable

user interaction; and they are in general appealing (Hauptman & Cohen, 2011). These characteristics make VVs an ideal means for depicting relationships between concepts and 3D objects that have been examined elsewhere (Hauptman & Cohen, 2011). More recently, the development of the Oculus Rift (a lightweight headset) technology, allows learners to experience 3D virtual reality beyond the use of a keyboard or touch screen; it is a means that enables the experience of full visual immersion (Parth Rajesh, Pooja Nikhil, Komal Deepak, & Mehta, 2014). The Oculus Rift technology allows users to look around the VW in the same way as they would do in real contexts (Parth, et al., 2014).

If VVs are appropriately implemented within educational contexts, their features offer the possibility to bolster both student engagement and the learning process by appealing to all of the learner's senses (Cheng, 2014). Further, virtual environments have a positive impact in the academic field as they are not only another means for content delivery, but efficient tools that can assist those areas where traditional methods are weak (Hauptman & Cohen, 2011).

Cheng (2014) has indicated that research conducted in Second Life has shown that learners convey positive attitudes in regards to this virtual platform as a means for content delivery. This positive perception is based on learner's academic achievement and preference in an online setting is highly influenced by the person's learning style, with Second Life being an enticing multi-modal way to introduce new material (Cheng, 2014). Additionally, Simonson, Smaldino and Zvacek (2015) have declared that the variety of sensory input available in virtual environments (e.g., texts, animations, visual clues) allow teachers to appeal to learners' different learning styles, hence covering a wider audience. It is the inherent nature of Second Life which promotes students' sense of immersion and co-presence in an online environment (Cheng, 2014). Co-presence is understood as the intersection of physical and social presence, where individuals have a sense of being together in a communal, shared environment (Martin et al., 2011). Corporeal co-presence is the most primitive mode of human togetherness. To interact with someone in corporeal co-presence is to interact with that person face-to-face from body to body (Zhao, 2003). Additionally, remote distance, when mediated by a virtual environment, resulted in electronic proximity (Zhao, 2003). Similarly, and as stated by students who were part of the Second Life group, they experienced a strong sense of immersion and presence when learning and interacting in the VW of Second Life.

Warburton (2009) argued that if situated within an educational context, the concept of co-presence can be linked to that of student and teacher presence; pivotal components in the Col model (Garrison & Anderson, 2003). In addition, the varied ways of stimuli that learners are exposed to in Second Life may result in students with different learning styles having their cognitive processes improved as a consequence of the extremely sensory-interactive medium (Hauptman & Cohen, 2011).

However, and in spite of all of the advantages outlined previously, VWs also have some constraints. In a study on the integration of VWs for learning and teaching conducted by Dickey (2011), teachers expressed their apprehension about students being able to customise their avatars as this may result in a fruitless distraction. Even more, some of the participant teachers observed that the vast majority of the avatars they encountered were very well shaped, attractive, and young (Dickey, 2011). The subsequent discussion revolved around their concern related to physical appearance, anorexia, race, and ethnicity: those teachers were worried about most of the avatars' appearance being extremely perfect (Dickey, 2011).

2.1.5 Distributed learning in Second Life

Nowadays, the *distributed learning* concept exemplifies how a student-centred approach is being applied in universities and schools (Simonson et al., 2015). The term *distributed learning* emerged in the mid-1990s as part of the educational technology literature and it acknowledged the importance of developing a learning strategy that enabled knowledge construction from the learner's point of view (Granger & Bowman, 2003). Distributed learning is a teaching model that removes the physical boundaries; learners and teachers can access the content regardless of time and place (Simonson et al., 2015). Additionally, this model can be utilised in conjunction with classroom-based courses that may enable the creation of complete virtual classrooms (Simonson et al., 2015).

It has been proposed that in a distributed learning environment the sense of being part of a group and the formal and informal interactions that take place before, during, and after classes are an important element of the whole learning process (Simonson et al., 2015). Additionally, Cheng (2014) has claimed that distributed learning in a Second Life environment lends itself to role-play activities and group discussion via avatar use, which has been demonstrated to prevent students' anxiety and support self-expression, hence increasing course involvement. Further, that the digital media and interfaces that learners are exposed to in a distributed learning environment support more developed cognitive

functions by enhancing reflection, decision making, and problem-solving abilities; hence promoting engagement and learning (Annetta et al., 2010).

Teacher interaction within a distributed learning environment is mediated by technology enabling timely support, feedback and consequently enhanced motivation for active learning (Annetta et al., 2010). According to research conducted in relation to the pedagogical use of distributed learning these environments trigger increased motivation, engagement, and learning in students (Cheng, 2014). For example, the area of language instruction has benefitted from the use of distributed learning environments since the possibility to practice the target language with native speakers has resulted in students' increased motivation and engagement in the tasks (Wehner, Gump, & Downey, 2011).

Distributed learning in a virtual space changes the paradigm of a traditional classroom with students being able to communicate with teachers via the multiple resources at their disposition and to complete study courses regardless of their physical location (Maamar, Faci, Loo, & Ghodous, 2012). Further, in such contexts teachers "become designers of and resources for their students' learning. Teachers become mentors and guides, offering feedback and formative assessment that fuels students' self-initiated learning" (Gee & Levine, 2009, p. 49). For example, Simonson, Smaldino, and Zvacek (2015) have reported on the case of a chemistry class where students worked with distant peers on real-world issues. Having that objective in mind, each student paired up with another student collaborator and worked on a specific part of the project. The use of distributed learning was reflected in the use of internet, online presentations, and information sharing using fiber-optic network (Simonson et al., 2015) The outcomes of the experience were successful, resulting in students becoming strongly involved in the topic, making new friends from the distant school, and teachers becoming moderators and tutors of the whole experience (Simonson et al., 2015). Opfer and Pedder (2011) have proposed that within a distributed learning experience, course entry and exit points may vary depending on students' previous knowledge and the required level of mastery to be achieved.

It is the use of a distributed learning context and the relevance of VWs which requires that teachers have the skills and knowledge to play important roles to mentor students in these environments (O'Connell & Groom, 2010). Additionally, it is the affordances of Second Life which compels educators to start using VWs to take learning beyond two dimensional text and web limitations to interactive participatory 3D environments (O'Connell & Groom, 2010). According to Gee and Levine (2009) in a distributed learning environment context

teachers have to become guides and mentors with indispensable 21st century skills, namely, the ability to solve problems with others, the use of media literacy, and critical thinking. Further, that the use of “digital media enable students to practice these competencies in VWs—through games or player-built worlds like Second Life” (Gee & Levine, 2009, p. 50). An example of this is Urban Science: a game that requires students to replan a city in a SimCity-like virtual environment (see, for example, <http://www.simcity.com/>). In this game-like context students have to make use of a range of different skills such as the ability to determine the most appropriate course of action, explain the reasons why they support or oppose an idea, economics, use specific vocabulary related to city planning, and develop guidelines and legislation to deal with problems (Gee & Levine, 2009). The researchers argue further that even though students are in a game-like environment it is still necessary for participants to act professionally since their actions mirror real world consequences. Additionally, students witness the application of language in real contexts learning how to develop language skills as well as other symbol systems and apply them in the resolution of authentic problems (Gee & Levine, 2009).

In a study on the use of distributed learning conducted by Litman and Davachi (2008), the researchers found that its utilisation enhanced memory consolidation and slowed the forgetting percentage from the recent to the postponed test. Consolidation was defined as “a time-related enhancement of mnemonic representations that reveals itself behaviourally through a decreased rate of forgetting” (Litman & Davachi, 2008, p. 714). Results reflected that, over a 24 hour interval, distributed learning helped to delay the forgetting rate although it was not possible to gauge its effect on the initial memory trace (Litman & Davachi, 2008). Further, that the collected data suggested that when reactivation happens immediately after the period of consolidation those memories are more permanent and memorable, than when compared to more immediate reactivation (Litman & Davachi, 2008). The educational importance in the use of distributed learning is that it is a deliberate guidance which improves the memory effectiveness (Litman & Davachi, 2008). The creation of a distributed learning environment, then, involves the use of technology and networked educational delivery through both synchronous and asynchronous means of communication. However, the inclusion of the human component has to be supported through institutional assistance and planning (Simonson et al., 2015).

Nevertheless, the inclusion of technological aids in educational fields calls for an understanding of learners’ perceptions regarding its effectiveness to successfully integrate

them in the curriculum (Venkatesh et al., 2014). Venkatesh, Croteau and Rabah (2014) have observed that it is necessary to shed light on students' perceptions of course efficacy to make sure the implementation of technology in higher education contexts results in better learning outcomes and quality of education. Further, future research should focus on how the integration of technology supports the development of cooperation and metacognitive skills (Venkatesh et al., 2014). Additionally, Razmerita and Kirchner (2015) have established that it is essential to understand students' perceptions of how collaboration is supported by technology for its efficient implementation in classroom contexts. There is scarcity of studies which have focused on how cooperation is supported by technology, and the influence of cooperation in group achievement (Razmerita & Kirchner, 2015).

However, to take full advantage of the educational potential of a virtual platform, teachers need to get familiar with the environment and its capabilities. The use of a model to guide this process is imperative if successful results are to be achieved.

2.2 Salmon's five-stage model for E-moderating

Achieving student satisfaction and successful outcomes in the Second Life environment heavily depends on the constant training, support, and development of teachers as moderators in this environment (Salmon, 2009). However, being a successful Second Life moderator requires the necessary skills to know how the gradual process of "getting into" the system works. The use of the five-stage model proposed by Salmon (2011) has been widely recognised as an effective framework for this to happen. The model uses a constructivist approach to learning and it is conceived as a scheme that helps e-moderators to enhance student commitment and learning in an online environment (Salmon, 2011). Additionally, her model is planned to illustrate and explain the role of both the e-moderator (or online facilitator) as well as the learner's (Salmon, 2011). In this model, there are five interrelated stages to be mastered which build upon previous consecutive phases. Along each of these stages there is a bar that clearly indicates what is expected of the participants in terms of interaction. The model also describes the e-moderating and technical skills that are required at each stage (Salmon, 2011) (see Figure 2.2).

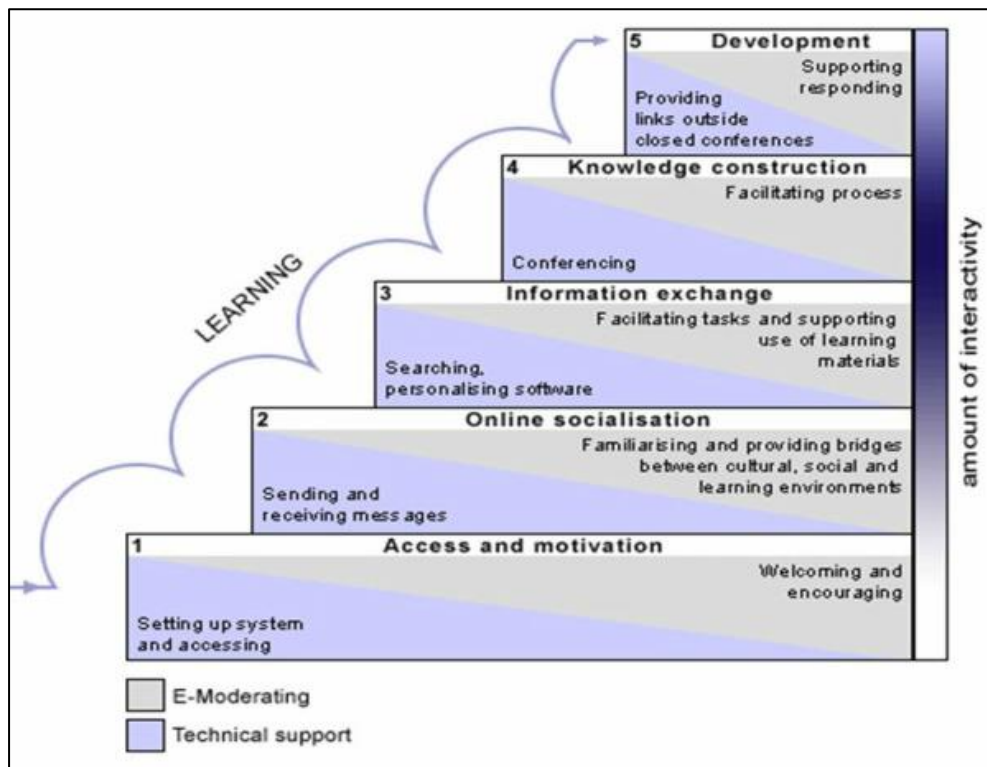


Figure 2.2 Salmon's (2011, p. 81) five-stage model for e-moderating.

The fundamental belief related to Salmon's (2011) model is that there is more to the learning process than just engaging in different activities on a computer. Azevedo (2002) also claimed that "learning is a complex phenomenon that includes an intricate and complex interaction between neural, cognitive, motivational, affective, and social processes" (p. 31). It has been proposed that the creation of an affective environment has a positive influence on learning since the brain areas that are related to learning are also connected with an individual's emotions (Weiss, 2000). In addition, it is also important to engage learners' confidence to make them feel safe, otherwise their brains will not be able to absorb the new data, hence not meeting the proposed objectives (Cain & Cain, 1994). One way to engage learners' confidence is by linking new learning content with what they already know (Cain & Cain, 1994). Further, it is fundamental to make learning *meaningful* by raising students' awareness of how the new information relates to what they already know (Cain & Cain, 1994).

Learning involves an interaction between learning about the topic, communicating with peers through computer-mediated channels, increasing personal confidence, and feeling comfortable with the dynamics of the online group (Macdonald, 2004). There are three types of interaction when working online: interaction with the "content" (course materials or references), interaction between the tutor and the student (Berge, 2007) and, third, the

much wider interaction between the e-moderator, who plays the role of the supporter and arbitrator, and the different participants (Salmon, 2011).

Stage one, *access and motivation*, involves participants being able to use online resources and the possibility for them to have access to these materials. According to Salmon (2011) stage number one has as its pivotal points the stance participants may have towards learning and their skills to obtain adequate and timely help. She argues further that being motivated to return to participation frequently and to devote effort and time to the task are also important issues (Salmon, 2011). To summarise, Salmon claims that it is important that students know what they are going to obtain from the system once they have accessed it. The overall aim of this stage is to help participants see the advantages of using technology; familiarise them with the virtual environment; and boost their confidence so that they thrive in using technology (Salmon, 2011).

Salmon (2011) claims that despite the fact that new users get the hang of any new piece of software fairly quickly, getting familiar with it and becoming an expert in its use can be an overwhelming task. She argues further that at this critical stage, users need constant reassurance as well as continuous technical advice (Salmon, 2011). It is at this stage when e-moderators need to welcome new users; offer them assistance; and pay attention to any indication of online activity performed by the participants (Salmon, 2011). There is a key challenge at this stage as participants want to feel competent in their learning and to have just enough difficulty but not too much. It is a mistake to assume that at this stage participants will be motivated by very challenging tasks, but of course they can also be put-off by those that are too easy (Berge, 2007). A balance has to be found because a situation that can just be demanding for one person, may be a complete obstacle for another one, so it is a necessity to offer constant individual support and to appeal to personal interests (Salmon, 2011). Additionally, participants should start to get the idea that they can look for meaning and value from the contribution of other participants and not just the e-moderator. This first stage is said to be complete when users have sent their first online message, and responded to at least one other (Salmon, 2011).

Stage two, *online socialisation*, involves participants becoming accustomed to interacting in the new online setting. According to Salmon (2011), from the very start of stage two, e-moderators should increase the support for each of the group members and respect for its individuals instead of focusing on personal goals. This in turn will result in a welcoming environment that improves the welfare and comfort of the online group (Salmon, 2011).

The author also established that when interacting online, users also have the possibility to build solid relationships as well as the skills to communicate their feelings effectively (Salmon, 2011). Getting to understand this concept is not difficult, however it is usually overlooked while trying to continue with the learning process (Salmon, 2011). An online community must be built up for engagement between participants to occur including relevant, authentic, and purposeful online learning activities which must also be introduced simultaneously to sustain the community (Aubert & Kelsey, 2003; Rossi, 2010).

The utilisation of virtual environments for educational purposes has become more important with the widespread use of the internet and the variety of tools available now (Salmon, 2011). Further, the development of trust is essential for any system requiring sharing and co-ordination to be effective (Salmon, 2011). As a result, at this stage e-moderators should create a safe environment that enables participants' free expression but with the necessary respect for other members' experiences and qualities (Salmon, 2011). Salmon (2011) established that during stage two, e-moderators have to construct the ideal environment for socialisation to happen in the online group. She also stated that it is important for participants to realise how an online environment "contributes to learning for *their* topic, *this* course, *this* discipline" (Salmon, 2011, p. 33). Additionally, the author claimed that the e-moderator has to use anything that is possible within his or her reach to encourage every possible feature of online socialisation if the ultimate goal is the development of a community of learning (Salmon, 2011).

Salmon's (2011) research suggests that at this stage participants have to make an effort to realise what their right place and time is within the online setting. It is because of this that the researcher claims that e-moderators have to introduce participants to the online learning system along with explicitly targeted support (Salmon, 2011). In addition, according to Salmon the second stage comes to an end the moment participants decide to reveal a bit about themselves in the online space. However, the e-moderator has to make sure that the social aspect of online conferencing keeps on going for those who still want it (Salmon, 2011). This can be done by creating a special area, namely, a "café" or "bar", or by providing conferences that may be of interest for a targeted audience. Nevertheless, Salmon expressed that there is a delicate balance to be kept between making other individuals responsible for e-moderating and the creation of a series of fruitless mini-conferences.

Information exchange, is the third stage in Salmon's (2011) model. A key feature of this stage is that all participants begin to value the equal access they have to a wide variety of online information (Salmon, 2011). There is a high volume of information that starts to be exchanged through messages considering that the "cost" of answering to information requested is minimal (Salmon, 2011). The need for the e-moderator to make sure that members are enthusiastic contributors with an active role to play is crucial (Salmon, 2011). The e-moderator needs to keep on working not only for lively participation and the development of effective online interactions, but also for those slower and shyer participants without criticising them (Salmon, 2011). Additionally, and for effective learning to happen, participants need to interact both with other people, including the e-moderator(s), and the program content as well (Salmon, 2011).

The role of the e-moderator at stage three is to plan and prepare *e-tivities* and conversations that motivate participants, link data and inspire beneficial information sharing in the online setting. This requires those e-tivities and forums to be carefully designed with a moderate level of difficulty (Salmon, 2011). Additionally, it is critically important to convey clear instructions and expectations to participants too (Berge, 2007). Salmon indicated that information overload is a possible issue at this stage and participants deal with it using different strategies. While some participants spend a lot of their online time reading and answering messages when necessary, others try not to read all of them. Nonetheless, there are also those participants who read all messages but do not respond at all (Salmon, 2011). Given these circumstances, it is the e-moderator's role to pay attention to the strategy being used and provide participants with the appropriate level of assistance (Salmon, 2011). Further, participants expectantly await the e-moderator's support and guidance to develop skills to both focus on the most important material and work through the considerable amount of messages (Salmon, 2011).

Salmon (2011) declared that considering the fact that participants' skills to search and decide on the most relevant information may still be not well developed, their requests for assistance are still significant. It is for this reason that online guidelines and discipline should be introduced by the e-moderator (Salmon, 2011). Additionally, e-moderators have an important role to play by encouraging participants when their participation begins to decline, since an e-moderator's vital skill is the capacity "to look beyond the obvious in participants' questions" (Salmon, 2011, p. 44). Another important role of the e-moderator is that of validating and giving legitimacy to the information that is being shared by participants as well as guiding the discussion processes (Salmon, 2011).

In Salmon's (2011) view, the importance of stage four, *knowledge construction*, is that at this level participants should have realised that knowledge transmission is not a set process; it cannot be passed on from one individual to the next in a predetermined way. Teachers can facilitate the exchange of information in students, but to achieve this "a learning and interaction scaffold and skilled e-moderation intervention are essential for high-level constructivist collaboration" (Salmon, 2011, p. 44). Additionally, at this level members start to cooperate with one another in more visible ways by explicitly communicating their ideas and perceptions of the topic being dealt with (Salmon, 2011). Salmon indicated that the key elements to augment students' understanding of different theories and ideas are the constant debate that occurs online as well as the use of examples provided by other participants. She states further that when this practice has started it augments progressively. In addition to that, the use of networked technology facilitates sharing the newly constructed knowledge, increasing participants' chances to share communal views as well as expand other participants' ideas (Salmon, 2011). In the study conducted, the VW of Second Life facilitated learners' exchange of and construction of knowledge which aligned with Salmon's model and, more specifically, the fourth stage.

Salmon (2011) declared that despite the fact that by stage four e-moderators should have generated a sense of "presence" within the groups, it is also important to gradually reduce the group dependence on his or her guidance by assigning responsibilities and tasks to group leaders (Salmon, 2011). Nonetheless, e-moderators have crucial roles to play within the online environment by creating and sustaining online groups (Salmon, 2011). Further, skilled e-moderators are able to bring together the different ideas expressed in forums due to the fact that all of them are accessible in a written form (Salmon, 2011). The act of combining these different ideas into one by the e-moderator has been termed "weaving" (Feenberg, 1989). Even more, Salmon claimed that an excellent e-moderator is able to relate participants' opinions to existing theories and ideas analysed in the course. Weaving is an active and somewhat time-limited activity that enables full and beneficial participation during active conferencing. One of the e-moderator's roles is to boost students' interest and engagement in the different discussions and e-tivities. However, Salmon claimed that it is also important not to extend them once they have lost momentum as they will naturally tend to disappear.

At stage five, *development*, participants do not need much support on the part of the e-moderator as they are already accountable for their learning through the use of computer-mediated opportunities (Salmon, 2011). She also claims that at this stage, participants are

more demanding in terms of software, access to materials and the e-moderator's responses (Salmon, 2011). A critical activity at this point is to ensure that participants are independent online and can personalise and appreciate the incredible experiences that are on offer and evaluate the personal learning benefits (Salmon, 2011). Salmon further stated that at stage number five, a constructivist learning approach is being used by both the participants and the e-moderator. It has been established that constructivism requires participants to analyse their own knowledge-building and thinking processes, being dialogic interactions a key element to generate knowledge (De Wever, Keer, Schellens, & Valcke, 2010). In addition to that, people's construction of new knowledge heavily depends on their previous personal background, namely, topic area, issue, and mental models which have a strong influence on their grasp of incoming information (Seel, 2001). Salmon states that the use of a new learning channel, such as online networking, triggers participants' understanding of both the new way of learning and the medium being used. Hence, it is normal that when participants reach this level they analyse the way in which they are interacting and assess the impact that technology has on their learning (Salmon, 2011).

Salmon (2011) has declared that if appropriate technical support and e-moderating assistance is given to all participants, they will advance through the different stages of the model arriving at stages three to five in an easier way. Additionally, Fisher (2003) has observed that at university level, lecturers are extremely keen to develop critical faculties in their students, which are considered essential for high-order thinking. Therefore, supplying suitable technical support and assistance facilitates the attainment of these critical skills (Salmon, 2011).

Although the five-stage model has extensive recognition, there is some criticism towards its use in a variety of contexts. According to Moule (2007) the development of the five-stage model was based on assisting experiences of online group working and networking. Hence, there is a limitation to it since the model ignores a series of learning theories and diverse e-learning methods that are accessible for use in a computer-mediated communication environment (Moule, 2007). Moule also stated that e-learning is not only circumscribed to communal learning but using an interactive web-based package or CD-ROM (as it is the case for isolated or remote communities) can also be a personal and instructional learning opportunity (Moule, 2007). Additionally, Chowcat (2005) declared that when the five-stage framework has been used to train mentoring head teachers in

Britain it has not been effective since the model presupposes that any specific course will be supported by an absolute online environment.

Chowcat (2005) also pointed out that the exact one week timeframe for each one of the five stages is another weakness in Salmon's (2011) framework, something that is difficult to maintain throughout the school year. This shows that Salmon's model does not reflect the possibility to use e-learning as a component which also includes face-to-face delivery (Chowcat, 2005). In addition, Moule (2007) also claims that there are major concerns related to the fact that implementing learning models in the classroom will become an obstacle for professional practice development. This claim is backed up by Lisewski and Joyce's (2003) difficulties in implementing the model as an outline for an e-moderating training course. This was reflected in the lack of consideration of individual learning styles and rigidity of its design (Lisewski & Joyce, 2003). In spite of the criticisms, the use of Salmon's five-stage model can contribute to establish the basis for a community of inquiry to flourish and ease the learning process in online environments.

2.3 The Community of inquiry (Col) model

Salmon's (2011) five-stage model contributed to the creation of the context within which computer conferencing and computer mediated communication (CMC) help support an educational experience. Garrison, Anderson and Archer (2000) claim that a meaningful educational experience, which includes a CMC background, lies at the centre of a Col model with students and teachers playing a pivotal role in the educational process. The Community of Inquiry model considers that the learning process takes place within the Community as a result of the interrelation of three key elements, namely: social, teaching, and cognitive presence as shown in Figure 2.3.

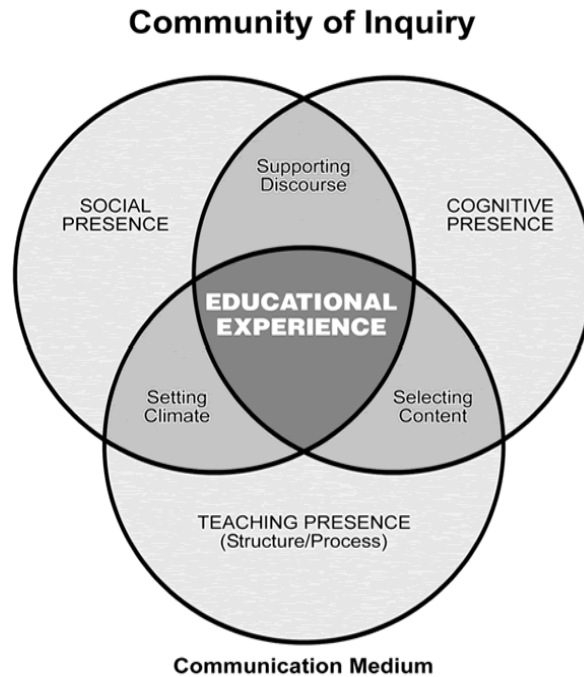


Figure 2.3 The Community of Inquiry model (Garrison, Anderson & Archer, 2000, p. 88)

According to McKerlich, Riis, Anderson and Eastman (2011), the concept of presence, in spite of the absence of bodily proximity, has been a focal element for educators and academics since the beginning of distance education more than 150 years ago. Further, it has been indicated that the teaching methodology used in distance education has been influenced by the way of delivery which has included three main successive modes, namely: traditional postal letters, multimedia broadcast and interactive technologies (McKerlich et al., 2011). Traditionally, dialogic interactions are the base upon which the teaching and learning process occurs (Garrison et al., 2000). Further, that oral interactions are dynamic, brief, unplanned, and not as structured as written communication (Garrison et al., 2000). However, practice has shown that in spite of what seem to be negative features of oral interactions, they can assist in the development of critical thinking in adequately-mediated small groups (Garrison et al., 2000). In face-to-face situations, spoken interactions allow participants to perceive and convey non-verbal cues such as voice tone and body language (Garrison et al., 2000).

In comparison, written communication may be considered an inadequate context to enhance face-to-face group dynamics since many oral and body cues are absent. However, one benefit of written communication is that it supplies reflection time (Garrison et al., 2000). Therefore, in order to develop higher-order cognitive skills, a written medium

may be preferable over oral communication (Garrison et al., 2000). Consequently, the use of writing skills is favourable if the aim is to develop reasoning skills, particularly if recorded messages can be seen by other users and exposed to feedback and responses (Salmon, 2011).

McKerlich, Riis, Anderson and Eastman (2011) point out that there are three main generations when it comes to distance education. The first one, termed cognitive or behaviouristic, was characterised by the adoption of regular correspondence. The focus was on the communication of knowledge in a traditional way and there was, basically, an absence of student presence and a strong emphasis on autonomous learning (McKerlich et al., 2011). The second one was the result of the interaction potential to communicate asynchronously and synchronously with teachers and amongst students themselves (McKerlich et al., 2011). Nowadays, the most traditional example of this is the cohort based e-learning class where students work collectively, usually for one academic semester, using an online platform which may be enhanced by the use of video conferencing or synchronous texting (McKerlich et al., 2011). The researchers have proposed that this second generation was supported by the Col model; it enabled practitioners to believe that it was possible to interact and learn despite the absence of physical contact: a fact that defined the first distance learning generation (McKerlich et al., 2011). Further, the Col model supported the second generation of distance learning, increasing the sense of presence. This model was developed as a reaction to the development of written forums and the constructivist-based distance education generation (McKerlich et al., 2011).

McKerlich et al. (2011) added that it was not until recently that the third generation of distance education, known as connectivism, has materialised being based on constructivist pedagogy. Further, connectivist education has as a central point the creation of networks, including both people and content, which can be used to solve real problems (McKerlich et al., 2011). The connectivist theory combines the fundamental aspects of network, chaos, self-organisation, and complexity theories (Siemens, 2004). Further, Siemens claimed that the beginning point of the connectivist theory is the person, with personal knowledge being part of a network which augments the knowledge that organisations have contributed with. In this context, presence is understood as the ability to connect with others through a variety of synchronous and asynchronous ways of communication. Presence also entails the creation and sharing of learning content and other artifacts within a constant developing global network (McKerlich et al., 2011).

According to Garrison and Vaughan (2008) each presence component that constitutes the Col model is closely interrelated to one another. The essential idea in the Col model is that three types of presence are required for learning to take place, namely: cognitive, social, and teaching presence (McKerlich et al., 2011). Garrison and Vaughn also indicated that each of those categories set the guidelines that assist putting the framework elements into practice to regulate the learning and teaching interaction (Garrison & Vaughan, 2008). As an example, the researchers state that the social and teaching components of the model will have a substantial influence on the cognitive presence component (Garrison & Vaughan, 2008). They argue further that the intersection points do not have to be equal but that any of the model components can be emphasised (Garrison & Vaughan, 2008).

In addition to that, McKerlich and Anderson (2007) declare that the Col model is based on different theoretical work such as Dewey's practical inquiry (Dewey, 1933); Garrison's paradigm of critical thinking (Garrison, 1991); and Lipman's community of inquiry (Lipman, 1991). McKerlich and Anderson have indicated that these researchers' work offers a practical experiential model and conceptual order to evaluate learning in synchronous educational contexts that incorporate the widespread use of text based discussions (McKerlich & Anderson, 2007).

2.3.1 Social presence

Within a Col paradigm, participants must have the right type of atmosphere to voice their opinions freely (Garrison & Vaughan, 2008). These researchers have also proposed that a sense of group belonging is also necessary to pursue their academic objectives and commitment to work. A community development is necessary to support a systematic learning process which starts with problem identification and finishes with providing a solution to it (Garrison & Vaughan, 2008).

The social presence component has three categories, namely, emotional expression, open communication, and group cohesion as it is shown on Table 2.2. The progressive establishment, maintenance and development of these categories lay the foundations for a community of inquiry to flourish (Garrison & Vaughan, 2008).

Table 2.2 Social presence aspect in the Community of Inquiry Model (Garrison et al., 2000, p. 89).

<i>Elements</i>	<i>Categories</i>	<i>Indicators (examples only)</i>
Social Presence	Emotional Expression	Expressing emotions, camaraderie
	Open Communication	Enabling risk-free expression
	Group Cohesion	Encouraging collaboration

Dialogic interactions and social contact are key elements that help establish significant communication with peers, which in turn results in the creation of a sense of bonding and trust (Garrison & Vaughan, 2008). Further, that a community of inquiry promotes relationships in participants who feel emotionally insecure to participate in open dialogue (Garrison & Vaughan, 2008). The social presence component provides the unifying element that supports focus and personal contributions towards the intrinsically collaborative community system (Garrison & Vaughan, 2008). Further, social presence is related to the student's potential to project his real identity in an online environment (McKerlich et al., 2011). Additionally, and in spite of treating participants as individuals, it is important that they commit responsibly to the community of inquiry model (Garrison & Vaughan, 2008). In addition, Brown (2001) claims that "after long-term and/or intense association with others involving personal communication" (p. 24), there is the development of personal rapport and in turn camaraderie may appear. She argues further that within a community of inquiry model the development of personal relationships amongst participants, as well as a level of comfort and trust, take some time to occur but eventually they evolve into camaraderie (Brown, 2001). Further, the development of camaraderie and emotional ties occur during the last stages of the development of a community of inquiry (Garrison & Vaughan, 2008). Garrison and Vaughn have pointed that the establishment of social presence is the ultimate goal when initiating a community of inquiry. Even though the establishment of social interaction is a key element in the community of inquiry model, its sole presence is inadequate to pursue educational objectives (Garrison & Vaughan, 2008). Additionally, social relationships do not help students to focus on and construct academic interest, even though they promote free speech, unity, and a feeling of belonging (Garrison & Vaughan, 2008). Even more, that there is more to a community of inquiry than just a chat room. Advanced levels of learning demand purposeful dialogic interactions that help participants to analytically reflect on,

construct, and confirm understanding. This process is known as cognitive presence (Garrison & Vaughan, 2008).

Social presence is a critical element of an online community and one that is critical to collaborative work (Palloff & Pratt, 2005). In the case of virtual environments, these immersive spaces supply a different scenario for social presence to occur (Dawley & Dede, 2013). The possibility to access and create different learning contexts, and a feeling of being there facilitates situated learning where users can learn in a different, real-like context (Dawley & Dede, 2013). According to Dawley and Dede, the feeling of being immersed in the environment is the result of customising the avatar; using multiple sensory information; employing varied ways to connect socially; constructing objects within the environment; and choosing the plot. Further, providing opportune feedback, which assists learners visualising their advance within the virtual environment, increases the sense of immersion and social presence (Dawley & Dede, 2013).

2.3.2 Cognitive presence

The inquiry process includes combining interactive and reflective processes, hence cognitive presence is a fundamental part of it (Garrison & Vaughan, 2008). The authors have stated that cognitive presence outlines the regular inquiry sequence of learning experientially based on reflection and the development of concepts to action and on to additional experience (Garrison & Vaughan, 2008). The term cognitive presence has been defined as “the extent to which meaning can be constructed by sustained communication within a group of people” (McKerlich & Anderson, 2007, p. 36). *Cognitive presence* has been described as the learner’s capacity to build and validate new knowledge by using discourse within the Col model (McKerlich et al., 2011). According to Garrison and Vaughan (2008) cognitive presence is a recurrent process which includes phases of confusion, elaboration and connection of ideas, and experimenting with possible solutions. This is shown in Table 2.3.

Table 2.3 Cognitive presence aspect in the Community of Inquiry Model (Garrison et al., 2000, p. 89).

<i>Elements</i>	<i>Categories</i>	<i>Indicators (examples only)</i>
Cognitive Presence	Triggering Event	Having a sense of puzzlement
	Exploration	Exchanging information
	Integration	Connecting ideas
	Resolution	Applying new ideas

Nevertheless, the application of inquiry is not an inflexible or continuous process; some issues may arise that require participants to make inferences and target exploration processes (Garrison & Vaughan, 2008). Additionally, other issues may require participants to use deductive skills and to apply solutions or ideas; there is a constant change from solution to exploration on part of the students (Garrison & Vaughan, 2008). Despite everything, practical inquiry is logical and as such requires that created hypotheses be supported logically, hence a community of inquiry is fundamental to create and maintain cognitive presence (Garrison & Vaughan, 2008). Additionally, teaching presence is a key component to build and maintain a community of inquiry (Garrison & Vaughan, 2008). Further, that this component contributes with the essential elements that “provide structure, facilitation, and direction for the cohesion, balance, and progression of the inquiry process” (Garrison & Vaughan, 2008, p. 24).

2.3.3 Teaching presence

Garrison and Vaughan (2008) claim that the teaching presence component helps to combine all the elements that make the community of inquiry a fruitful process. Teaching presence is related to the teacher and older, more experienced, students’ influence in facilitating and ensuring a significant educational experience (McKerlich et al., 2011). Further, teaching presence within the Col model was related to the teacher’s direct or indirect control on the plan, management, and learning assistance to guarantee a relevant instructional experience (McKerlich et al., 2011). Additionally, the teacher’s binding role was essential in creating the Col environment as well as keeping equilibrium between social and intellectual aspects that were directly related to the expected educational results (Garrison et al., 2000). Creating and preserving a community of inquiry is a demanding educational process with the teaching component supplying the appropriate academic plan, assistance, and guidelines to accomplish a productive academic experience (Garrison & Vaughan, 2008). According to Garrison, Anderson, and Archer (2000) there

are three types of teaching presence, namely: *instructional management*, *building understanding*, and *direct instruction*. The first indicator is related to fundamental teaching aspects such as establishing the syllabus and time specifications, planning evaluation methods, and using the medium (Garrison et al., 2000). The second indicator is related to constructive learning gain; a challenging and stimulating procedure creates the crucial atmosphere to maintain a Col (Garrison et al., 2000). The final indicator involves those aspects that evaluate the conversation and adequacy of the learning process (Garrison et al., 2000). Table 2.4 shows the roles of the teacher within the Col model.

Table 2.4 Teaching presence aspect in the Community of Inquiry Model.
(Garrison et al., 2000, p. 89)

<i>Elements</i>	<i>Categories</i>	<i>Indicators (examples only)</i>
Teaching Presence	Instructional Management	Defining and initiating discussion topics
	Building Understanding	Sharing personal meaning
	Direct Instruction	Focusing discussion

In Garrison and Vaughan’s (2008) views, the teaching presence component enables the appropriate integration of the cognitive and social components of the community of inquiry model. The researchers have claimed that teaching presence assists in establishing the methods, syllabus, and, in general, it guides, mediates, and establishes the focal points and tasks (Garrison & Vaughan, 2008). Further, teaching presence is a vital and demanding task particularly in a blended environment where students are not always physically present and are constantly moving between interaction that is mediated by the environment, and direct communication (Garrison & Vaughan, 2008). In addition, Garrison (2006) states that within the Col model, students expect a substantial teaching presence. Additionally, Perry and Edwards (2005) claim that “exemplary online teachers create a community of inquiry that is comprised of a strong social, cognitive, and teaching presence” (p. 47). Taking into account an online teaching-effectiveness view, “good instructors created community; poor instructors didn’t” (Conrad, 2005, p. 12). Similarly, students expect and value teachers’ guidance and structure (Garrison & Cleveland-Innes, 2005a). Furthermore, Arbaugh (2007) states that there is a strong correlation between perceived learning, contentment with the delivery medium, and teaching presence.

The Col framework has shown strong empirical validation (Garrison & Vaughan, 2008). In a study on outcomes prediction using the Col framework conducted by Arbaugh (2008) the student sample was obtained from a Mid-Western university in the United States. Participants belonged to 55 out of the 56 courses offered in an online MBA program that lasted over six semesters: from February 2004 through January 2006. The courses covered different topics, namely, business strategies, human resource management, and international business. These subjects were taught by 17 different teachers whose expertise ranged from having taught over forty online courses, to no previous online teaching experience (Arbaugh, 2008).

The study data collection process was completed in two steps. The first step took place during the last week of the course and consisted of emailing a survey to all students to explore their perceptions about different aspects. These aspects covered satisfaction with the use of the internet as the delivery medium and learning environment; instructor behaviours; and acquired knowledge (Arbaugh, 2008). After seven to 10 days, the second step took place. It consisted of sending a paper copy of the survey to all those students who had not responded to the electronic one. In total 656 students supplied useful answers (Arbaugh,2008). The results obtained from Arbaugh's study imply that the Col model can be used to predict what the students' perceptions of learning in online MBA courses is.

Additionally, in a study conducted by Garrison, Cleveland-Innes, and Fung (2004) a questionnaire was developed and validated to investigate role adjustment in students who had recently been introduced to a community of inquiry in an online context. These researchers' study was conducted with the objective of analysing students' expectations before experiencing online learning; it included 65 subjects enrolled in two graduate programs at Athabasca University (Garrison et al., 2004). The researchers' instrument was built on confirmed indicators based on empirical facts belonging to each component of the community of inquiry model (Garrison et al., 2004). This was done by writing the instruments' items in such a way that they were related to the three components of the Col. The instruments' items from 1-8 were designed to reflect cognitive presence. Items 9-15 reflected social presence, and items 16-28 reflected the teaching presence component (Garrison et al., 2004). The theoretical model for online learning, on which the community of inquiry is based, shaped the study and helped determine the essential conditions and aspects that are connected with role adjustment to online learning (Garrison et al., 2004).

A factor analytic process showed that the questionnaire reflected the theoretical model having high face validity.

Certain weaknesses have been identified in relation to the Col model. Jézégou (2010) criticises the model for not having explicit conceptual foundations. She states that the creators of the community of inquiry model restrict their explanations about it due to the fact that the model was built on research studies on constructivism, more specifically those deriving from socio-constructivism (Jézégou, 2010). She also states that Garrison and Anderson (2003) do not explicitly explain the way in which they incorporate those studies into their model (Jézégou, 2010). In addition, Jézégou also criticises Garrison and Anderson's (2003) introduction of their model of community of inquiry "by evoking its affiliation to the North American Anglophone philosophy of pragmatism" (Introduction section, para. 2).

In addition to that, Xin (2012) claimed that it is necessary to determine what the relationships amongst the three community of inquiry elements are. She states further the need to acknowledge that the discussion that takes place in an online environment is more chaotic, complicated, and not as straightforward as it is presented in the model. She also indicated that the conversation that takes place in an online environment is a disorganised spontaneous exchange of information which somehow accomplishes the goals established in the course program (Xin, 2012). A theoretical model that acknowledges this phenomenon has to consider the elements of order and chaos (Xin, 2012).

In spite of these weaknesses, the use and implementation of the Col for learning showed to be effective within context. Additionally, the use of a cooperative approach enhanced these participants' learning experience even more. However, and as previously explained, learners' prior educational background (influenced by the use of a teacher-centred approach) may have been detrimental in some aspects as it opposes student-centred learning practices.

2.4 Cooperative learning

Cooperative learning (CL) is an effective way of constructing knowledge with group participants being responsible for their own learning and that of their classmates' (Johnson, Johnson, & Holubec, 1998). Additionally, the importance of CL in educational contexts is that it fosters social competence and psychological well-being, group achievement, and interpersonal relationships (Jolliffe, 2007). Further, cooperative learning

provides a secure learning environment, optimises classroom achievement, and boosts self-esteem in students who have special learning needs (Jenkins, Antil, Wayne, & Vadasy, 2003). Within educational contexts, the terms cooperative and peer learning; teamwork and collaborative group work are often used interchangeably (Jolliffe, 2015).

CL involves students working closely as a group to maximise not only their own learning but also that of their peers (Johnson, Johnson, & Holubec, 1998). More than 40 years of research have proven that both academic and interpersonal skills are favoured by the use of CL (Jolliffe, 2015). The use of cooperative learning involves students working collectively in small groups to accomplish common goals (Alghamdi & Gillies, 2013). In a nutshell, it is possible to say that CL “requires pupils to work together in small groups to support each other to improve their own learning and that of others” (Jolliffe, 2007, p. 3). Additionally, Jolliffe (2007) has observed that cooperative group work differs from mere group work in the sense that cooperation requires the tasks to be structured and achieving a shared goal.

Having students work in small cooperative groups enhances their ability to listen to each other, exchange opinions and views, ask for and receive assistance, make joint decisions to solve problems; and build new knowledge and learning collectively (Gillies & Boyle, 2008). From a Piagetian and Vygotskian perspective, knowledge construction with others is important as these authors acknowledge that cognition development occurs in social settings (Gillies, Ashman, & Terwel, 2008). Additionally, Johnson and Johnson (2003c) have contended that cooperative learning fosters a group philosophy where students work together to help and achieve their goals. These researchers have also observed that cooperation helps establishing a sense of group cohesion which augments motivation in students to achieve their own objectives and those of the group (Johnson & Johnson, 2003c). Additionally, Cuban (1993) expressed that in spite of the brief physical contact time between teacher and student, this contact is still an essential element for meaningful learning to take place. Spatial and temporal structures are also firmly in place and imposed on learners for the learning process to occur (Relan & Gillani, 1997). Further, that for the learning process to be successful, content is generally separated into smaller instructional units which follow a predetermined sequence and time; fields of study are taught within a fixed schedule and order (Relan & Gillani, 1997).

The implementation of cooperative practices in the classroom also involves the issue of power delegation (Lotan, 2004). When delegating authority, there is a redefinition of the

traditional role that teachers have played in the classroom which is not easy for many teachers be they experienced or inexperienced educators (Lotan, 2004). Some struggle with the loss of being the focal point in the classroom who continually and persistently regulate students' behaviour and learning (Lotan, 2004). Others worry that without direct and constant supervision, the high-school classroom might deteriorate into chaos, that is, students will not understand what needs to be done, they will make too many mistakes and they will not complete their assignments (Lotan, 2004). Like teachers, students need to learn how to adjust to delegation of authority. New ways of interacting with their peers require new norms of behaviour (Lotan, 2004). In the same tenor, Baines, Blatchford and Kutnick (2008) claim that educators have voiced their concern in relation to the use of cooperation in the classroom. These apprehensions are related to students experiencing problems in learning from peers; loss of discipline and task focus; excessive time spent in group work; outstanding students learning in detrimental conditions; and the evaluation of students when working in groups (Baines et al., 2008). However, for cooperation to be successfully established within a group learning context, there are certain elements that have to be present.

2.4.1 Key elements of successful Cooperative Learning

For a condition to be considered cooperative, there are five elemental components to be present, namely: positive interdependence, individual accountability, promotive interaction, appropriate use of social skills and group processing (Johnson, 1999; Johnson & Johnson, 1989; Johnson, Johnson, & Smith, 1998a). These will be discussed further here.

2.4.1.1 Positive interdependence

According to Johnson and Johnson (2005) the use of positive interdependence in a group allows participants to be aware that their own work has a direct effect on the group. This creates and augments responsibility forces that increment the student's effort to succeed (Johnson & Johnson, 2005). Additionally, when positive interdependence has been established, students know that each member's unique contribution is vital for the whole group to reach its objectives (Johnson, Johnson, & Holubec, 1990).

Johnson and Johnson (1989) also state that positive interdependence may include three other subtypes, namely: outcome, means, and boundary. The first subtype of interdependence, *outcome interdependence*, contains real or fantasised objectives and prizes (Johnson & Johnson, 1989). Regardless of the way it is done, the inclusion of outcome interdependence is likely to result in augmented levels of production and

achievement (Johnson & Johnson, 2003c). The second subtype of interdependence, *means interdependence*, occurs when students have to share materials, assume different roles, and finish tasks to attain the group's objectives (Gillies, 2007). Johnson and Johnson (2005) stated that these methods are interrelated and not separated from each other. The researchers state that materials can be split amongst the members of the group; the roles can be assigned to each one of the group participants; and tasks can be shared to increase participant's commitment towards the group and its objectives (Johnson & Johnson, 2005). The last subtype of interdependence, *boundary interdependence*, is helpful to establish students' relationships when working interdependently (Johnson & Johnson, 2005). Additionally, boundary interdependence may exist despite sudden interruptions between participants who may discriminate other individuals into isolated groups (Johnson & Johnson, 2005).

2.4.1.2 Individual accountability

Individual accountability is another essential component for effective cooperation to occur (Johnson & Johnson, 2009). This type of accountability exists when each individual's actions are evaluated against an established performance or guideline to eventually be given back to the group and the individual (Johnson & Johnson, 2009). Hooper, Ward, Hannafin, and Clark (1989) have observed that cooperation has a higher rate of success when structured individual accountability has been implemented. Additionally, individual accountability includes students becoming aware that they are responsible for their contributions to the group; freeloading is not accepted since everyone must contribute to reach the group's objectives (Gillies, 2007). Students' level of self-efficacy increases when they receive and provide knowledge to the group. As a consequence, students' motivation to work for the group's success increases (Gillies, 2007). If there is certainty about each student's contribution, if there are no unnecessary efforts, if individual accountability is high, and if members feel accountable for the final results, then social loafing disappears (Johnson & Johnson, 2009). In addition, group size is important because the larger the group, the less likely its members are to perceive their personal contributions, hence affecting the group's potential to succeed (Kerr, 2001).

2.4.1.3 Promotive interaction

Promotive interaction is another essential element for effective cooperation to occur (Gillies, 2007). Promotive interaction takes place when students have visual contact with one another and engage in face-to-face dialogic interactions to analyse the group's task

(Gillies, 2007). Additionally, that promotive interaction takes place when students give support and assist other peers' efforts to reach the group objectives (Johnson & Johnson, 2008b).

Johnson and Johnson (2009) have further maintained that promotive interaction within groups involves students sharing resources and materials; trusting one another; supplying peers with effective help; staying motivated for the group's benefit; and making sure that peers' efforts are useful to achieve the group's objectives. In addition to that, the researchers also claim that supplying peers with feedback, to better their work, and challenging their way of thinking, results not only in better decision making but also contributes to develop promotive interaction (Johnson & Johnson, 2009). The personal collaboration and relationships are the result of students working closely with others, being able to understand both the verbal and nonverbal cues and body language that are central to building personal connections (Gillies, 2007).

2.4.1.4 Appropriate use of social skills

For effective group cooperation to happen, social skills, task work, and skilled team work are essential elements (Johnson & Johnson, 2009). Students must be taught and motivated to use social and group skills if the objective is to achieve high quality cooperative work (Johnson & Johnson, 2009). For the group to achieve their common objectives, participants have to take care of and welcome members into the group; find practical solutions to common problems; familiarise themselves with and trust the other group members; and communicate effectively (Johnson & Johnson, 2009). Even more, if participants are to successfully work together and handle the stress levels, they must have some of the previously mentioned social and group abilities which eventually constitute the elemental links among them (Johnson & Johnson, 2009).

To increase the group's production and participants' accomplishments, providing each participant with feedback about his or her use of intended social skills is more beneficial than giving it to the whole group (Archer-Kath, Johnson, & Johnson, 1994). Additionally, Gillies (2007) has also claimed that students must learn to respect turns, make egalitarian decisions, and share materials equitably. Further, that these skills are not easy to master, especially with numerous classes where they are rarely given the chance to interact with their peers and are expected to be passive recipients of the teaching that occurs (Gillies, 2007).

2.4.1.5 Group processing

Finally, group processing is another essential element of cooperation. Group processing involves students agreeing on which actions are to be changed or continued; and thinking about performed actions which were fruitless or constructive (Johnson & Johnson, 2009). The aim of using group processing is to analyse and enhance those processes being executed by participants which will enable the whole group to achieve its objectives (Johnson & Johnson, 2009). It has been proposed that reflecting on other members' group efforts may culminate in the compensation effect with participants working harder to improve real or imaginary group deficiencies which in turn improves overall group achievement (Williams & Karau, 1991). Furthermore, group processing includes a formative evaluation component since students try to improve the processes that will allow them to attain their objectives (Gillies, 2007).

Additionally, group processing includes students asking metacognitive questions of the type "*How are we doing? Is there anything else that we should be doing? What could we do differently?*" (Gillies, 2007, p. 5). Gillies also states that group processing stimulates reflection on the members' role since participants have to conclude whether there are changes to be made to unify the group activity and in this way increase group members' contribution (Gillies, 2007). In addition to that, group processing encourages respect among members because every single contribution and effort towards the group is considered as a valuable component to attain the final objectives (Smith, Tyler, Huo, Ortiz, & Lind, 1998). Further, group leaders' expressions of respect towards group members contribute to develop participants' self-esteem (Smith et al., 1998). When groups evidently contain the abovementioned five fundamental elements of cooperative learning, the groups are referred to as being structured, whereas when those elements are not evident, the groups are referred to as unstructured (Gillies et al., 2008).

In a study on the effect of cooperation on achievement conducted by Yager, Johnson, Johnson, and Snider (1986), the researchers analysed and compared three different cooperative groups. Cooperative group number one did not contain the group processing component; cooperative group number two was based on individualistic work; and cooperative group number three included the processing component (Yager et al., 1986). The study showed that those low-, medium-, and high- achieving members belonging to the group with the processing component had a better result regarding post-instructional accomplishment and content recollection than those members from the other two groups (Yager et al., 1986).

In another study on cooperation in VVs, Fiedler (2009) suggested that cooperation levels were improved in these types of environments due to the environment's characteristic of reducing the distance between participants. This was achieved as a result of the abundance of technical information which fosters the group's direction towards cooperation (Fiedler, 2009). Further, Stevens (2003) has identified that the use of CL with middle school students helps increase their reading and writing skills. Foley and O'Donnell (2002) have claimed that CL successfully helps understanding science classes at high school level. Additionally, Sahlberg and Berry (2002) stated that CL promoted problem solving in mathematics.

In a cooperative base group, participants have basic obligations towards the rest of the group members (Johnson & Johnson, 2008a). These obligations include members assisting and encouraging other participants to finish tasks; making sure that all participants are progressing academically in a similar way; and making all participants responsible for the learning that occurs (Johnson & Johnson, 2008a). Additionally, cooperative groups are also characterised by the regular meetings held by their members (fortnightly or daily); lasting one academic period (year or semester); and including diverse member composition (for example regarding accomplishment incentive) (Johnson & Johnson, 2008a). It is the inclusion of these five elements that enables cooperative groups to be miscellaneous and durable learning groups with permanent members' enrolment (Johnson & Holubec, 2002; Johnson & Johnson, 1998b).

More recently, technological improvements have allowed the inclusion of cooperative learning in virtual contexts (Kupczynski et al., 2012b). Kupczynski et al. have pointed out that when comparing learners working cooperatively in a face-to-face and online environment, those in the online setting had the benefit of more interaction with the teacher, preparation time, and class participation than those working face-to-face. It has been indicated that there are four different kinds of cooperative learning that can be used in conjunction with instructional technology, namely: "formal cooperative learning, informal cooperative learning, cooperative base groups, and academic controversy" (Johnson & Johnson, 2004, p. 788).

In a study on the use of virtual learning environments with game-like activities for language learning, Berns, Gonzalez-Pardo and Camacho (2013) observed that these types of environments have positive educational results when complemented with cooperative guidelines for group work. Learners showed improved vocabulary acquisition, motivation,

and listening comprehension (Berns et al., 2013). They also indicated that teachers need to be certain that learners are receiving the necessary guidance for learning to be successful as well as explore new avenues for students to acquire the expected competences (Berns et al., 2013). In another study on the use of virtual environments to enhance collaborative learning in formal education conducted by Blas and Paolini (2014), the researchers noticed that participants improved technical and language skills, and learned more about the topic being dealt with. Further, that teachers played a pivotal role in these environments managing groups and making sure the process was developing smoothly (Blas & Paolini, 2014). However, and despite the positive outcomes of the foregoing studies, the validation of cooperation as an effective learning method in an online medium has not been thoroughly examined (Kupczynski et al., 2012b). In addition, Kupczynski, Mundy and Maxwell (2012a) have also observed that more research is necessary to explore students' perceptions of collaborative learning in online and virtual contexts.

The review of the literature has enabled identification of research gaps upon which the research questions that guided this study were based. The suggestion that the establishment of cooperation in an online medium has not been completely examined (Kupczynski et al., 2012b) has led this study to explore the difference in learning cooperatively in a 3D virtual and face-to-face context. It has been indicated that not many studies have focused on how technology favours the efficient implementation of cooperation in classroom contexts (Razmerita & Kirchner, 2015). Based on this claim, this study sought to explore the effectiveness in the use of a 3D virtual environment for cooperative teaching and learning and how this compared to a face-to-face context. Further, the necessity to increase the knowledge on students' perceptions of technology and how technological aids support the development of cooperation (Kupczynski et al., 2012a; Venkatesh et al., 2014), led this study to analyse students' perceptions of the teacher's role in implementing cooperation in technology-mediated and face-to-face environments. In addition, and considering that there are no systematic efforts to prepare teachers to work and establish collaboration in VWs (Guzzetti & Stokrocki, 2013), this study sought to explore the effect that a teacher has when given the training to teach in a virtual environment.

2.5 Research questions

Based on the research gaps identified, the following research questions were developed to guide this study:

Primary research questions:

- 1) What difference does the use of a 3D virtual environment make to cooperative learning when teaching about Australian historical events and geographical information to Chilean pre-service teachers?
- 2) How effective is the use of a 3D virtual approach to teaching about historical events when compared to a face-to-face, cooperative learning approach?
- 3) What effect does the teacher have in virtual environments (Second Life) to learning?
- 4) What are the students' perceptions of the role of the teacher in virtual environments (Second Life) and in face-to-face contexts?

The secondary research questions for this study are:

- 5) What are the differences between students' learning in a traditional face-to-face cooperative learning environment versus an online 3D cooperative learning environment?
- 6) Does learning occur to a greater degree in a 3D VW or in a face-to-face structured cooperative group?
- 7) Are there specific aspects of teacher guidance that students perceive as contributing to their learning of cultural knowledge and cooperative work in virtual environments, such as Second Life?

The research objectives that are to be met for this research project are:

- 8) To compare a traditional face-to-face cooperative learning environment and an online 3D cooperative learning environment.
- 9) To explore students' perceptions on the role of the teacher both in a face-to-face context and in a 3D virtual environment.

To answer these research questions, a multiple case study design comprised of two case studies with two embedded units of analysis from each type of environment – virtual and face-to-face was utilised. Additionally, focus groups and one-on-one interviews were also

conducted with participants working in the two types of environments. This qualitative information was supported by quantitative information obtained from the achievement test specifically created and validated for this study, and the Cooperative Learning Questionnaire used and validated by Gillies and Ashman (1996).

To summarise, the literature review chapter covered the topic of VWs highlighting the importance of VWs such as Second Life to enhance learning due to its affordances. It also emphasised the use of feedback for learning as well as the different learning styles that this VW can appeal to. The five-stage model developed by Salmon (2011) for online teaching and learning was presented as well, explaining its importance to establish online learning. The Col model was introduced and explained emphasising how its three components (social, cognitive, and teaching presence) can enhance online learning. Additionally, it offered an overview of what cooperative learning is, including the key elements to establish this approach successfully. It also included contemporary research studies whose results show the advantages in the use of virtual environments when paired with a cooperative approach to teaching and learning. The literature review has also enabled identify the gaps in the literature that this study aimed at contributing. These gaps related to pre-service teachers not being equipped to adjust to varied instructional roles required to develop cooperative work in VWs (Ernest, Heiser & Murphy, 2013) and the need to focus on how cooperation is supported by technology (Razmerita & Kirchner, 2015). The following chapter, *theoretical framework*, provides the theories which constituted the boundaries and elemental basis that delineated this study.

3. Theoretical framework

This chapter addresses the different theoretical approaches which provide the boundaries that help delineate this study. It helps to clarify the reasons why the use of a student-centred approach to learning captured participants' attention in comparison to a teacher-centred one, which is vastly used in the Chilean educational context. The chapter presents the theories that help understand cognitive development in individuals. It starts with Vygotsky's (1978) theory of social constructivism, explaining that cognitive development and learning are socially enacted processes. For Vygotsky, an individual's learning takes place within the zone of proximal development (ZPD), which is facilitated by a more capable adult or peer. Vygotsky's ZPD scaffolding theory is complemented by that of Hannafin's (1983) who identified four different kinds of scaffolding that contribute to guide learning: procedural, strategic, conceptual, and metacognitive. Equally important is the scaffolding provided for this learning to take place.

Additionally, and closely related to Vygotsky's theory is the theory of social interdependence developed by Johnson and Johnson (1989). This theory affirms that learning takes place in conjunction with others and is the result of cooperative efforts. In contrast, Piaget's (1952) theory of cognitive development asserts that for learning to occur, the individual does not have to be in the company of others. Moreover, this isolated observation of the world and learning are enacted by the processes of assimilation and accommodation which are two interrelated mechanisms. Further, Piaget (1952) believed that individuals go through a series of sequentially predetermined stages of intellectual development. Finally, according to the theory of Connectivism proposed by Siemens (2004), individuals are part of an ever-changing network of knowledge. This theory also states that it is possible for knowledge to reside outside individuals (Siemens, 2004). The researcher asserts that the ability to discern important information from unimportant is vital considering the dynamic foundations upon which knowledge is constructed (Siemens, 2004).

3.1 Cognitive development theories

When trying to establish the connection between efficient teaching and successful learning outcomes, theories derived from cognitive psychology play a central role in explaining this relationship (McInerney & McInerney, 2010). From these cognitive points of view, it is implicit that efficient learning takes place when people build their own understanding; there

is an emphasis on the learner's diligent role in constructing personal meaning and understanding the information that it is at his disposition (McInerney & McInerney, 2010). A constructivist learning view focuses on the intellectual contents present in the learners' minds and the ways in which these contents are reflected in the learners' daily personal physical interactions with their environments (McInerney & McInerney, 2010). This is known as personal constructivism because it explicitly draws attention to the fact that knowledge is pro-actively built by the learner through self-discovery and exploration rather being taught by someone else (McInerney & McInerney, 2010). One constructivist theory that has had a profound repercussion on how educators perceive the learning process is the theory of social constructivism developed by Vygotsky (1978).

3.1.1 Vygotsky's social constructivism

The main theme in Vygotsky's social constructivist theory is related to intellectual advancement being the result of the transformation of biologically driven processes into more developed psychological operations (Diaz, Neal, & Amaya-Williams, 1990). Further, Vygotsky's theory states that infants are born with various kinds of affective, cognitive, and thinking abilities which are shaped by the individual's social and educational context (McInerney & McInerney, 2010). Among the social and educational inventions there are those such as language and social structures which are the result of higher human cognition (McInerney & McInerney, 2010). In Vygotsky's theory, learning tools that include symbol systems such as language, numbers and technology permit society members to construct new knowledge, interact, resolve problems and think (McInerney & McInerney, 2010). In addition to that, it has been observed that dialogic interactions in social learning environments where self-explanations and explanations to others are used enhance cognitive development (Thanh, 2014). Further, the use of social working environments helps create the suitable atmosphere for students to build new knowledge, explore and express themselves (Thanh, 2014). Based on this, it can be concluded that "the most significant moment in the course of intellectual development, which gives birth to the purely human forms of practical and abstract intelligence, occurs when speech and practical activity, two previously completely independent lines of development, converge" (Vygotsky, 1978, p. 24). Further, that infants' use of tools prior to the emergence of language is akin to that of primates. However, when dialogue and signs are integrated into children's daily activities, there is a complete modification and organisation of those daily actions (Vygotsky, 1978).

According to McInerney and McInerney (2010), Vygotsky asserted that the cultural context has a direct influence on infants' cognitive development. The cultural group development is closely linked to its individuals' constant activity, and at the same time individuals grow and develop as members of this group (McInerney & McInerney, 2010). Therefore, for Vygotsky, the development of intellect is not only related to an improvement of the individual's mental capacities, but also to the development of the individual's cultural understandings (McInerney & McInerney, 2010). The individual becomes part of the social context and, the social context becomes part of the individual in a constant exchange of knowledge (McInerney & McInerney, 2010). In this manner, social constructivism differs from personal constructivism and its focus on the intellectual processes that happen within an individual's mind (Marshall, 1996). Further, Kozulin (2003) has observed that Vygotskian theory specifies that a child's advanced cognitive processes development relies on the existence of agents that mediate the child's interaction with her context. In addition, mediation is the pivotal element in a series of current studies which are based on Vygotsky's theory or developed independently (Kozulin, 2003).

Kozulin (2003) has indicated that it is possible to distinguish two aspects of the mediation process, namely, a human and a symbolic one. The researcher declares that the human mediator aspect occurs twice during development: the first time it takes the form of real physical interaction amongst individuals; the second time it occurs as an internalised form of the aspect (Kozulin, 2003). It is because of this reason that a central issue in sociocultural studies based on Vygotskian theory is to try to explain how those physical actions that take place between people then become an internal cognitive function (Kozulin, 2003). In a study on mediation between individuals, Werstch and Stone (1985) documented the synergy between a 2½ year old girl and her mother while the former was working on a puzzle. Taking into consideration a "model" puzzle, the child was to finish a "copy" puzzle with her mother's assistance (Kozulin, 2003). At the beginning, the interaction between the two individuals was based on the child asking the mother where the puzzle part should be placed and the mother focusing the child's attention to the "model" puzzle. By the end of the process the child's verbalisation resulted in self-direction and the need to consider the original model was no longer indicated by the mother but it was the child's need (Kozulin, 2003). From a Vygotskian zone of proximal development perspective, the child transitioned from the child's zone of proximal development as being directed by the mother, to her actual independent development zone (Kozulin, 2003).

On the other hand, the role of symbolic mediators is related to the individual's direct contact with surrounding physical stimuli as well as the experiences that are the result of symbolic mediated interactions (Kozulin, 2003). According to Kozulin, within the vast array of instruments and tools there exists the ample area related to higher-order symbolic mediators which involves descriptive organisers, writing, varied signs, symbols, and formula. Further, Kozulin (1998) argues that, from a Vygotskian perspective, intellectual development relies upon the child's capacity to master and internalise symbolic mediators as internal psychological tools.

Roth and Lee (2007) maintained that working with others collaboratively is part of the learning process through which an individual becomes part of the collective. Further, that language, inventions and tools created by one culture may be totally different from those that belong to another culture, hence education must contextualise the learning process considering cultural and social factors (McInerney & McInerney, 2010). One of the main elements in Vygotsky's theory is the zone of proximal development which is derived from the notion that learning occurs in social contexts. The ZPD is "the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). Additionally, according to Chaiklin (2003), the ZPD is commonly conceived as the result of the interaction between two individuals, one more skilled than the other, to solve one specific task together. As a result of this contact, the less skilled individual becomes capable of doing autonomously the task that, initially, he was incapable of doing without the assistance of a more knowledgeable peer (Chaiklin, 2003). This researcher also claims that this general conception results in three central aspects of the ZPD being emphasised, namely: *generality assumption*, *assistance assumption*, and *potential assumption* (Chaiklin, 2003). Further, that these three aspects constitute a perfect type known as the common interpretation of the ZPD (Chaiklin, 2003). Firstly, according to Chaiklin, *generality assumption* is based on the notion that an individual can perform a larger number of tasks in the company of others than in isolation. Secondly, *assistance assumption* emphasises the fact that learning outcomes rely on the interaction with a more skilled person, generally a teacher (Chaiklin, 2003). Finally, *potential assumption* is based on learning being determined by how prepared and ready the learner is to face the learning process (Chaiklin, 2003). According to the author, the *potential assumption* aspect of the ZPD seems to include the idea that the learning process can be improved greatly and easily if

the zone of proximal development can be clearly identified in an individual (Chaiklin, 2003). These three aspects shaped the sessions as the teacher took them into consideration throughout the learning process; they contributed towards these students' cognitive development and their knowledge construction.

3.1.1.1 *The ZPD and the role of teachers in scaffolding students' learning*

McInerney and McInerney (2010) have proposed that Vygotsky believed that the social environment in which infants grow plays a central role in their learning. Additionally, teachers, classmates and parents have direct contact with and influence on the child's learning process through education that is organised based on social conventions (McInerney & McInerney, 2010). Further, according to Vygotsky (1978) learning at school is always connected with the child's prior experience and learning. For instance, when studying arithmetic at school level, children have already experienced addition, subtraction, and division (Vygotsky, 1978). Undoubtedly, the type of informal learning experiences differs from the institutionalised processes that occur at school level, which is mostly focused on the grasp of basic scientific concepts (Vygotsky, 1978). However, children start learning when they ask their first questions and incorporate the names of objects that surround them (Vygotsky, 1978). In addition, children learn language from adults as well as varied information by asking and giving answers (Vygotsky, 1978). Further, it is through imitation of adults or being told how to act that children develop a complete set of abilities. This shows that there is a close interconnection between development and learning which starts in children's early days (Vygotsky, 1978).

Vygotsky (1978) recognised that the learning process has to be closely related to the child's level of cognitive development. However, it was not until recently that attention has been drawn to the fact that it is not possible to pay attention only to determining developmental levels if the aim is to establish the connection between learning abilities and developmental processes (Vygotsky, 1978). The first level of intellectual development, which may be termed the *actual developmental level*, is the result of a completed developmental stage in a child's intellectual development (Vygotsky, 1978). The second stage in a child's intellectual development, termed *the zone of proximal development*, is related to those mental functions that are not fully grown yet but are in an evolving phase (Vygotsky, 1978).

Additionally, Vygotsky (1978) declared that the use of the ZPD method permits measurement not only of those developmental stages that have already been achieved

and finished, but also those ones that are in an initial phase of creation and evolution. Therefore, the ZPD enables an outline of an individual's near future and his current state of development, acknowledging not only those developmental phases that have already been completed but also those that are in a formative state (Vygotsky, 1978).

The central characteristic in Vygotsky's (1978) theory is the assumption that there is a disparity between the learning and developmental processes. The learning process is usually one step ahead in relation to developmental stages; the gap between both of them results in the zone of proximal development (Vygotsky, 1978). Vygotsky's idea of the zone of proximal development changed the notion that when children master a determined process, their intellectual formative progress has finished: in fact it has just started.

One essential aspect of Vygotsky's (1978) theory relates to the zone of proximal development which includes the individual's current capability to solve problems independently and under the guidance of more knowledgeable capable peers. Although from a very early stage a child is equipped to solve problems naturally, those efforts are enhanced and promoted by more skilled individuals; it is the development of those latent skills which requires supervision (Wood, Bruner, & Ross, 1976). Additionally, Wood, Bruner, and Ross argued that the addition of new higher skills in infants follows a certain type of order in which "more basic" constituent abilities are connected so that the child can perform more demanding tasks. Further, Wood, Bruner, and Ross have proposed that the concept of skill development in infants is looked at from the perspective that the learner is in a state of isolation. If the social setting is considered, skill development is considered as an imitation process of the patterns and behaviours the child is exposed to (Wood et al., 1976). However, if teacher intervention is considered, his mediation and assistance regularly includes a "scaffolding" process which permits the child to solve problems and complete tasks that would be, otherwise, impossible to complete without assistance (Wood et al., 1976). The scaffolding process that takes place consists of the more capable peer controlling those elements that would obstruct task completion, thus permitting the child to focus on those elements that are within his capability area (Wood et al., 1976).

3.1.1.1.1 Scaffolding and learning within the zone of proximal development

Reiser (2002) claimed that scaffolding is the pivotal element in the concept of cognitive apprenticeship where learners become gradually more responsible in solving problems with the structured guidance of a more capable individual. In addition, Azevedo, Cromley, Winters, Moss, and Greene (2005) defined scaffolds as strategies, tools, and guides which

can be created to assist students in the regulation of their learning. Further, Dvorak (2004) established that scaffolding includes breaking up complex concepts into simpler notions and ideas that are then reconstructed to communicate the main concept essence. According to Azevedo et al. (2005) the scaffolding process can be supplied not only by humans, but also animated teachers, computer tutors, and peers, during the learning process so that learners get the grasp of complex concepts. However, for the learner to use and benefit from the assisting scaffolding, solution recognition to the problem comes before the production of the successive steps that will permit him/her to solve that problem without assistance (Wood et al., 1976). Additionally, Wood et al. (1976) stated that there cannot be effective feedback if there is no solution recognition to the problem prior to starting to work on its solution. To gain knowledge from the final results, the learner has to proceed to identify the connection between the method being followed to achieve a specific end (Wood et al., 1976). Pifarre and Cobos (2010) have declared that the scaffolding process includes a gradual withdrawal from the more capable peer's supervision and control as the learner gains a growing understanding of a specific issue and task.

Wood, Bruner, and Ross (1976) have observed that the scaffolding method consists of different tasks on the part of the teacher. The first task is termed *recruitment* where the teacher needs to attract the learner's interest to, and focused on, the task's requisite (Wood et al., 1976). The second one is termed *reduction in degrees of freedom* and it includes the simplification of the different task components so that the learner can reach a final solution successfully (Wood et al., 1976). The third task is known as *direction maintenance* and the teacher usually makes use of sympathy and excitement to keep learners motivated and focused on achieving the task's objectives (Wood et al., 1976). There is an additional aspect to *direction maintenance* where previous success becomes a distracting element from the learner's final objective (Wood et al., 1976). An efficient teacher is capable of keeping the students focused and willing to take a risk to achieve that objective (Wood et al., 1976).

A fourth vital task of the teacher is the *marking of critical features*, hence those relevant elements are emphasised for students to recognise them (Wood et al., 1976). Feature accentuation supplies information about the difference between what the teacher expected as a final product and what the learner's final product is. It is the teacher's role to explain such differences (Wood et al., 1976). *Frustration control*, the fifth teacher's fundamental task is related to the fact that "problem solving should be less dangerous or stressful with a

tutor than without” (Wood et al., 1976, p. 98). However, the main risk related to this feature is that learners are too dependent on the tutor (Wood et al., 1976). Finally, *demonstration* or “*modelling*” solutions to a task encompasses showing an ideal performance. It may comprehend explanation or finalisation of a partial solution already achieved by the learner (Wood et al., 1976). In regards to this, the teacher reproduces an attempted solution that the learner has already tried; it is expected that the learner will “imitate” that behaviour in a more evolved and perfected way (Wood et al., 1976).

The inability of learners to comprehend the assistance they have been offered results in that scaffolding experience being specific only for that particular situation and so would not have provided learning support (Reiser, 2002). Scaffolding then requires that the teacher establish a tactful balance between assistance provision and constant learner engagement in the task (Reiser, 2002). Wood, Bruner, and Ross (1976) declared that humans are the only ones where intentional tutoring occurs during childhood. Even though some primates learn from other older primates, no evidence shows that the elders try to intentionally teach those younger ones (Wood et al., 1976). It is then an inherent capacity of the human species to learn from and teach others (Wood et al., 1976).

Cognitive science research has focused on the transition from social interaction as the traditional scaffolding supplier to technology as the source of assistance (Reiser, 2002). However, in looking for ways to assist learners, the learning problem also has to be restated, starting with an individual who is learning under a more capable person’s supervision to targeting the tools and context in which learning is embedded (Reiser, 2002). Further, instead of just focusing on the learner, it is important to look at what both the learner and tool as a system can achieve (Reiser, 2002).

In the study on the function of hypermedia as a scaffolding method conducted by Azevedo et al. (2005), the researchers examined the way in which hypermedia assisted students’ learning and acted as a mediator between external and self-regulated learning. Azevedo et al.’s definition of the term scaffolding was akin to that used by Wood, Bruner, and Ross (1976) in the sense that, firstly, there was a common idea related to the task goal to be achieved between tutor and tutee. Secondly, the tutor provided graduated assistance based on a permanent and continuous assessment of the student’s progress. This graded support demands that the tutor makes constant adjustments according to the student’s level of improvement (Azevedo et al., 2005). Thirdly, the continuous dynamic evaluation results in flexible support which permits the tutor to oversee the student’s progress and

supply feedback accordingly (Azevedo et al., 2005). Fourthly, and finally, there is a progressive withdrawal of the tutor's support, but it never gets to the point where the learner is left completely alone (Azevedo et al., 2005)

Additionally, Hannafin, Land, and Oliver (1983) determined that there are four kinds of scaffolding, namely: procedural, strategic, conceptual and metacognitive. Procedural scaffolding can be used to help learners use the available resources at their disposition. Strategic scaffolding provides learners with alternative approaches and techniques for learning, or suggestions for initial questions. Conceptual scaffolding helps learners to understand the complex problem space currently under consideration, or to clarify misconceptions by providing structural maps, content trees or explicit hints. Finally, metacognitive scaffolding helps learners manage their individual thinking processes by reminding them to reflect upon their goals, or proposing self-regulatory strategies and related monitoring processes (Hannafin et al., 1983).

Azevedo and Hadwin (2005) have claimed that there is evidence to suggest that there is deficient self-regulation and an unsuccessful grasp of new concepts in learners when they acquire new knowledge in a computer-based learning environment (CBLE) without proper scaffolding. According to Azevedo et al. (2005), the utilisation of adaptive scaffolding by either a computerised tutor or a person has been proven to strengthen specific aspects of the learning process in students, such as metacognitive monitoring. Further, research has indicated that adaptive scaffolding is beneficial because human tutors possess the capacity to constantly oversee the students' learning process and provide prompt scaffolds when necessary (Azevedo et al., 2005). Additionally, Azevedo et al. claimed that research conducted with middle school students showed that those participants who were designated to the modelling scaffolding situation obtained better results than those who were working without scaffolding. Those students who were part of the modelling scaffolding group had the assistance of a trained scientist who adapted to students' personal learning requirements and who would guide them and explain the use of specific strategies to solve problems (Azevedo et al., 2005). Additionally, Alevan and Koedinger (2002) examined the contribution of computer-based education and its assistance in scaffolding self-explanation. Studies have suggested that the metacognitive strategy of self-explanation improves learner's content understanding when they explain material to themselves or when they verbalise the steps they followed to solve a problem (Alevan & Koedinger, 2002). The researchers assessed the contribution that a new high-school geometry syllabus named Cognitive Tutor Geometry makes to enhancing students' self-

explanation. This syllabus includes an almost identical amount of time for out-of-the-classroom practice to in-class learning and practice with an instructional software or “cognitive tutor” (Aleven & Koedinger, 2002). The cognitive tutor supplies personalised guidance and assistance in the learn-by-doing process, something which is difficult for a single teacher in a traditional classroom environment to accomplish due to time restrictions (Aleven & Koedinger, 2002). Further, in Aleven and Koedinger’s (2002) view, cognitive tutors have proved to be useful in increasing learners’ mathematic accomplishments when compared to conventional mathematics classes. Even more, a third-party assessment research into the use of cognitive tutors revealed that they measurably changed classroom habits and helped raise students’ engagement (Aleven & Koedinger, 2002).

The use of a scaffolding method supplies the required academic assistance that is necessary by higher education students; scaffolding helps create a safe environment where learners can implement and analyse content knowledge in the absence of marking or judgment (Bailey, 2010). Further, the use of scaffolds during learning helps in the evolution of higher-level intellectual capacities in those learners who are still unprepared for a higher-educational level (Bailey, 2010). These thinking abilities in turn will permit them to successfully complete more difficult tasks (Bailey, 2010). In addition to that, Bailey has maintained that the development of cognitive scaffolding entails mutual understanding of the task’s objective which is linked to a permanent evaluation of the learner’s degree of comprehension. Tutoring, then, is a way in which an individual works under the supervision of a more skilled person and constructs new knowledge within a social environment (Bailey, 2010). Building new knowledge with others is intimately related to social interdependence: a theory that asserts that learning takes place while interacting with others (Johnson & Johnson, 1989).

3.1.2 Theory of Social Interdependence

The theory of social interdependence by Johnson and Johnson (1989) is related to Vygotsky’s (1978) belief that learning occurs in social contexts. The assumption about learning socially is based on the fact that, depending on the task objectives’ organisation, individuals cooperate, and that cooperation determines the situation’s outcomes (Deutsch, 1949). Additionally, Johnson (1999) established that cooperative learning is based on learners’ common help, trust, and the exchange of needed materials. On the other hand, competition “tends to induce and be induced by obstruction of each other’s success, tactics of coercion and threat, enhancement of power differences, deceptive communication, and striving to “win’ conflicts” (Johnson, 1999, p. 936).

According to Johnson and Johnson (2011), in recent decades the theory of social interdependence has been augmented to incorporate the situations under which competition may produce a positive outcome. Additionally, Johnson (1999) has established that competitive efforts have a constructive outcome when there is no great emphasis on winning; there are explicit rules and principles for winning; and all participants have a fair possibility to win. Social interdependence exists when the achievement of goals is subjected to other people’s actions. Positive interdependence is related to individuals’ perception of a correlation between their goals’ achievements and that of others. Negative interdependence exists when individuals’ perception of their goals’ attainment is linked to the failure of other individuals. The psychological outcomes from positive interdependence include substitutability, inducibility, and positive cathexis. Figure 3.1 presents an overview of the theory of social interdependence.

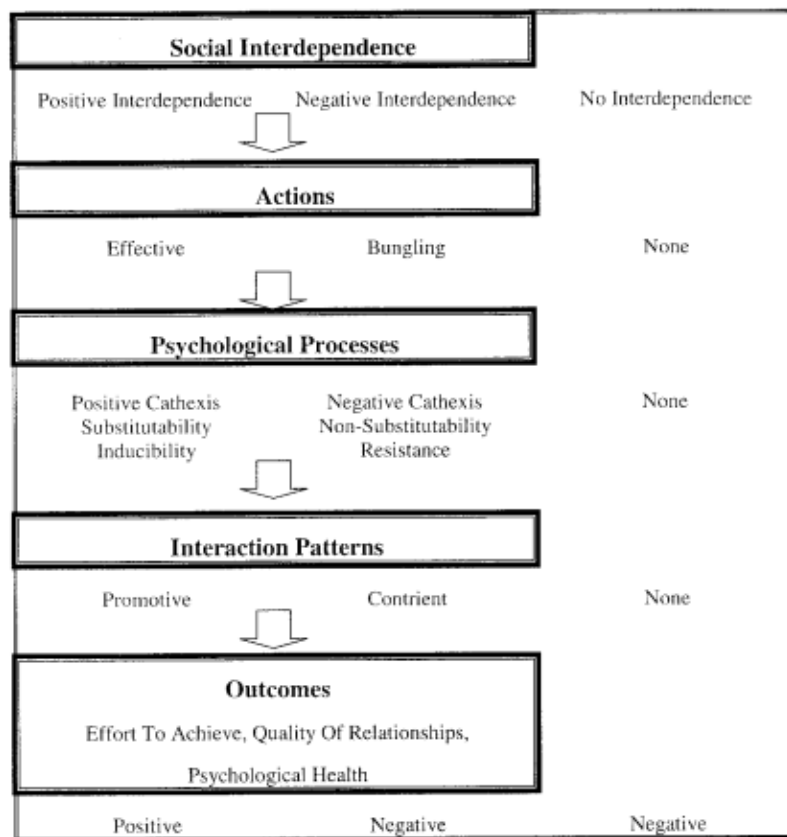


Figure 3.1. Overview of social interdependence theory (Johnson, 1999, p. 935).

Johnson (1999) stated that research suggests that cooperation results in a better emotional condition, and more constructive relations than do egocentrism or competition. Additionally, cooperation is based on positive interdependence which, in turn, results in promotive interaction (Johnson, 1999). In accordance with Johnson the utilisation of the social interdependence theory in the educational field has proven that a cooperative

approach to teaching and learning produces in the students a deep engagement in the learning process. Cooperation creates the ideal setting for concurrent accomplishment of students' varied learning objectives while focusing on varied social issues and considering learners' specific needs (Johnson, 1999).

In the educational field, the use of cooperation involves the use of small pedagogical groups whose aim is to enhance students' outcomes while working together in the company of their peers (Johnson, 1999). In addition to that, the dynamic group essence is determined by its members' interdependence where any adjustment in one the components alters the whole group's synergy (Johnson, 1999).

Furthermore, it is the creation of mutual objectives that fosters interdependence in group members which, in turn, causes the whole group to work together towards the achievement of those objectives (Johnson, 1999). The types of existent interdependence are positive and negative (Johnson & Johnson, 2011). The former occurs when individuals have the feeling that they can achieve their objectives only if other members in their groups can achieve them too (Johnson & Johnson, 2011). Positive interdependence develops into promotive interaction which is the process by which learners facilitate other members' efforts so that the group can achieve its joint objectives (Johnson & Johnson, 2011). The latter occurs when learners feel that they can only accomplish their objectives if other group members, with whom they are competitively related, are unsuccessful in achieving their goals (Johnson & Johnson, 2011). Negative interdependence eventually develops into oppositional interaction where learners obstruct and discourage other members' endeavours to achieve their objectives (Johnson & Johnson, 2011). There is also the case of no interdependence where there is no interrelationship among group members' attainments; individuals do not acknowledge that the accomplishment of their objectives is linked to the achievement of other group members (Johnson & Johnson, 2011).

Vygotsky (1978) highlighted that a child's learning is the internalisation of socially significant ways of behaving (McInerney & McInerney, 2010). Further, that it is by "the process of acquiring these cultural resources that learners achieve membership in the social group" (McInerney & McInerney, 2010, p. 56). However, for another contemporary of Vygotsky (1978), Piaget (1952), children develop their cognitive skills, and progress through the different stages of intellectual development in isolation rather than within social contexts.

3.1.3 Piaget's theory of cognitive development

The theory of *cognitive development* elaborated by Piaget (1952) has a dual and complementary perspective that may be termed *constructivism* and *structuralism* (Inhelder & de Caprona, 1987). From a Piagetian point of view, children build their awareness of the world through interactions and actions with surrounding objects (McInerney & McInerney, 2010). Piaget viewed children as “small scientists” who build “powerful theories of the world as a result of applying a set of logical mental structures in increasing generality and power” (McInerney & McInerney, 2010, p. 39). Furthermore, Piaget also argued that cognitive evolution is the result of the learner going through a series of levels, each one characterised by individual cognitive structures; something he termed *structuralism* (McInerney & McInerney, 2010). While the structuralist part of the theory has had a not so profound effect on current educational practice, the constructivist element is strongly dominating contemporary educational practices (McInerney & McInerney, 2010).

A focal point of Piagetian theory is the belief that children explore and understand the world around them through the tools they develop, such as language (McInerney & McInerney, 2010). Piaget's elemental stance was that knowledge is the result of the individual's actions, and those actions are part of the process of interacting with the environment (McInerney & McInerney, 2010). Further, Piaget's constructivist view is based on the interconnected concepts of the function of self-regulation in the evolution of thought (or equilibration); development of intellectual structures; and connection between thinking and action (McInerney & McInerney, 2010). It is by integrating actions, that belong to different situations, that a person can internalise those actions and use them again to predict upcoming events in dissimilar circumstances (McInerney & McInerney, 2010). Additionally, it has been declared that the understanding of how the world functions, how we can interact with it, comes from internalised action knowledge (McInerney & McInerney, 2010). Piaget also emphasised that actions should not only be restricted to facts, but also developed into intellectual operations that can be attained by assisting the child to gradually reduce the dependence on direct external support (McInerney & McInerney, 2010). This can be done by, for example, moving from physical to visual representations and then to mental descriptions of operations which are not currently performed (McInerney & McInerney, 2010).

As a biologist, Piaget was impressed with how organisms can systematise and organise their processes coherently as well as have the ability to adapt themselves to the environment (McInerney & McInerney, 2010). Further, according to Piaget the

mechanisms that play a role in the morphological and physiological development of humans also influence the evolution of intelligence (McInerney & McInerney, 2010).

In the case of infants, Piaget hypothesised that they have insufficient operative psychological schemes to deal with world events, but at the same time enormous capability to establish progressive intricate thinking processes (McInerney & McInerney, 2010). Moreover, Piaget considered that the individual is a dynamic agent with the capacity to constantly reorganise and understand the surrounding environment to adjust it to his own cognitive scheme (McInerney & McInerney, 2010). Piaget labelled these ways of dealing with experiences as “schemes” (McVee, Dunsmore, & Gavalek, 2005).

According to McInerney and McInerney (2010), Piaget maintained that these schemes correspond to thinking structures that are arranged in such a way that they contribute to organise the infant’s experiences and perceptions. When novel events happen, the child adjusts by associating this recent experience to usual ones; this process is called assimilation (McInerney & McInerney, 2010). However, at other times when the new experiences require a more profound transformation on the part of the child, it is necessary to deal with something completely new; this process is called accommodation (McInerney & McInerney, 2010).

Additionally, accommodation results in the development of a different scheme which at times can be modified, leading to a progression (McInerney & McInerney, 2010). The existing tension between the requirements of the assimilation and accommodation process (the child adapting to or learning from new situations) is what causes the development of new understanding and equilibrium in the child (McInerney & McInerney, 2010). For Piaget, the development of new thinking skills included assimilating new knowledge to the pre-existing one, and accommodating that previous knowledge to the novel facts, hence keeping the balance of former cognitive structures (McInerney & McInerney, 2010).

Establishing constant connections with students’ previous knowledge is facilitated by the use of thought-provoking questions which induce high-level cognitive processing that improves the learning process (King, 2008). These questions involve more than mere reconstruction or repetition of the material students had been presented with. Giving an answer to an intellectually demanding question requires a higher-level of mental processing, because to answer those types of questions “one must make inferences, generate relationships among ideas, draw conclusions, and develop elaborated rationales or justifications” (King, 2008, p. 77). Further, King has also established that the mere fact

of presenting students with intellectually demanding questions generates in them higher-level mental processes. However, to produce that question the inquirer has to identify central themes; how those are linked to each other; and how they relate to students' previous understanding and background.

Over time, children develop a set of different increasing operations that enable them to employ inferential thinking whereas infants are limited to dealing with experiences and thinking in a concrete form (figurative knowledge) (McInerney & McInerney, 2010). On the other hand, adolescents are capable of thinking about and solving problems using more advanced operational schemes (operative knowledge) (McInerney & McInerney, 2010). In the case of adults, their cognitive development continues to grow beyond what was termed by Piaget as formal operations (Fischer, Yan, & Stewart, 2003). Adults' way of thinking is contextualised and it is more dynamical and flexible than that of children and adolescents; grown-ups show varied levels of understanding for the same task depending on different circumstances (Fischer et al., 2003).

3.1.3.1 Piaget's stages of intellectual development

While working on the development of intelligence tests at the Binet Institute in the 1920s, Piaget became increasingly captivated by children and their inability to answer correctly questions which needed logical thinking (McLeod, 2015). Piaget's belief about children's incapacity to give a correct answer was based on differences between the way children and adults reason (McLeod, 2015). Piaget's (1952) developmental stages outline the different phases that individuals go through from infancy to adulthood and which include the development of knowledge and thought (Shroff, 2015).

Piaget (1952) established that as part of the intellectual development process, there are four phases that most children go through, namely: sensorimotor; preoperational; concrete-operational; and formal operational. Each of these phases has specific characteristics related to the way in which children solve problems and perceive the world that surrounds them. Additionally, each of these stages results in the development of refined intellectual processes that eventually lead to the achievement of entirely logical intellectual operations (Piaget, 1952). These stages are as follows:

Stage 1: Sensorimotor stage

During the first two years of their life, children discover their surrounding world through motor actions which becomes their elemental knowledge of their environment (McInerney

& McLnerney, 2010). Children recognise that they are separate individuals from their surrounding world by manipulating and interacting with the physical objects surrounding them (McInerney & McLnerney, 2010). Sensorimotor intelligence does not require the use of linguistic skills, but it is based on actions, perceptions and movements that are coordinated in a relatively stable way (McInerney & McLnerney, 2010). Sensorimotor constructions result in representational thinking which sets the foundations for the mental anticipation of future behavior (McInerney & McLnerney, 2010).

Stage 2: Preoperational stage

The next stage in Piaget's (1952) cognitive development takes place when children are between two and seven years of age. During this stage, children begin to get acquainted with surrounding objects not only through the physical manipulation of them but also through what they represent symbolically (McInerney & McLnerney, 2010). The development and acquisition of language represents an advance in children's ability to reason about the surrounding world, which provides intellectual flexibility. Due to language use, and to its symbolic role, it is possible for children to call upon objects that are not physically present; reconstruct the past; or to make projects and plans for the future (Slater & Muir, 1999). This means that children are able to cover spatio-temporal spaces in a much better way than they were able to (Slater & Muir, 1999). During the entire preoperational period, children's cognitive development is reflected in the improvement of their abilities regarding language, reasoning, perception, and problem-solving skills (McInerney & McLnerney, 2010). Further, children's grasp of objects is freed from the boundaries of physical appearance, resulting in a more varied range of aspects being integrated, which leads to a more complete understanding of the object being observed (McInerney & McLnerney, 2010).

Stage 3: Concrete-operational stage

One characteristic of children going through the concrete-operational stage, between the ages of seven and 11, is that, unlike the preoperational stage, they are able to consider a variety of salient features, hence having decentred thought (McInerney & McLnerney, 2010). Further, concrete-operational children can focus on the successive phases in an object transformation, also being able to mentally reverse the operations that produced a specific result (McInerney & McLnerney, 2010). Concrete operational children will always state that the most comprehensive category is larger than the subclasses (Slater & Muir, 1999). Consequently, concrete-operational children have the skill to perform varied logical

operations to solve problems and think and reason about the world. However, these operations are circumscribed to concrete experiences, hence the essence of the operations are not hypothetical situations or objects but concrete and real ones (McInerney & McInerney, 2010).

Stage 4: Formal-operational stage

In the last stages of the child's development of intelligence, they are able to think in a scientific abstract way (McInerney & McInerney, 2010). At this stage, between the ages of 12 until adulthood, children have a united logical cognitive system that they use to examine abstract relations and hypothetical situations that are not directly related to content; children become able to think not only based on concrete objects but also hypothetical situations (Slater & Muir, 1999).

According to Piaget (1952), children should have a central role in and engagement with the content they are learning. Further, there should be an appropriate correlation between the child's current cognitive stage and the logical properties of the content under examination (Piaget, 1952). This has led to a number of teaching materials and curricula being designed following Piaget's stages of intellectual development, which show the sequence between children's previous knowledge and experiences and the content to be taught, so as to maximise their learning (McInerney & McInerney, 2010).

Even though cognitive theories focus on the person and their development of knowledge, there has been an expansion of this focal point in which theorists also consider the social environment in which this knowledge is built and the mutual essence of this process (McInerney & McInerney, 2010). According to Vygotskian sociocultural theory, knowledge is not individualised but constructed in groups by using language and tools within a cultural context. It is because of this that the learning that takes place in a mathematics class, for instance, is different from a science class (McInerney & McInerney, 2010).

From a Piagetian point of view, teacher's straightforward commands and guidance may constrain the individual's comprehension of new content if this instruction obstructs his own discovery process (McInerney & McInerney, 2010). This situation opposes the Vygotskian idea of scaffolding and the constant communication between the individual and other group members to assist his development of world knowledge and awareness (McInerney & McInerney, 2010). Furthermore, Piaget proposed that developmental maturity is the main concern when it comes to gaining knowledge from learning

experiences and in saying so he highlighted how important unstructured experiences are for an individual's thinking development (McInerney & McInerney, 2010). In contrast, Vygotsky stressed the importance of constant direction and facilitated exploration that results in mental evolution (McInerney & McInerney, 2010).

From a perspective that considers higher mental processes, Piaget maintained that these processes have distinguishable specific and formal operations (McInerney & McInerney, 2010). In contrast, Vygotsky held that it is the sociocultural environment that outlines those mental cognitive processes rather than the presence of specific and formal operations (McInerney & McInerney, 2010). Certainly, from a Vygotskian perspective cognitive processes are limitless and adaptable, that is, intellectual development may lead individuals in varied directions that will prepare them to endure their subsistence within their specific sociocultural setting (McInerney & McInerney, 2010). Cognitive development has no limitations because it takes place within the zone of proximal development which is in a constant state of transformation and development (McInerney & McInerney, 2010). Currently, developments in technology permit individuals to experience learning in the company of others despite the fact they may not be interacting physically with them. That has allowed for the emergence of a new theory that explains how this knowledge is constructed: connectivism.

3.1.4 Connectivism: An alternative theory to learning

The vast majority of the learning theories claim that learning is an internal process (Siemens, 2004). Indeed, in spite of social constructivist theories stating that the learning process takes place socially, they still highlight the individual's supremacy in the process (Siemens, 2010). Additionally, classical learning theories do not consider the learning that occurs outside of the individual and it is shaped by technological tools. Even more these theories, traditionally, do not focus on the importance of the content that is being learnt but on the learning process (Siemens, 2010). Siemens (2004) stated that the capacity to determine and assess if any specific content is worth learning is a meta-skill that has to be used before the learning process takes place. In addition to that, theorists normally re-examine and expand pre-existing theories depending on the variation of circumstances. However, there is a point at which the fundamental conditions have changed so drastically that a completely novel approach is required (Siemens, 2010).

The inclusion of connection making and technological tools as part of the educational process has initiated a transition for learning theories to be within the digital age arena

(Siemens, 2004). Traditionally, experience has been considered as the best source of knowledge. However, since it is not possible to experience everything, the best way to acquire that knowledge is by creating connections (Siemens, 2004). In addition, knowledge making and learning involve the development and withdrawal of the different connections that have been established amongst different individuals, or the rearrangement of those connections (Downes, 2012). The development and use of web products is a medium for different people to disseminate their works and theories. Unfortunately, making comments and posting online is only made by a small group as the majority just prefer to read (Bell, 2011).

Siemens (2004) established that chaos, as a science, acknowledges the connection of everything to everything, a fact which is a novel situation for individuals who depend on and work with knowledge. Further, the learning process as a self-organised situation demands for the system, both organisational and personal, to be open and dynamic in terms of information. That means, its structure has to be changeable to interact with the environment (Siemens, 2004). Self-organisation has been defined as structures, behaviours, and sequences that are automatically created based on primary random circumstances (Siemens, 2004).

In addition to that, a network (defined as communication between systems) can be social or computer in nature and it is based on systems, groups, and individuals being linked to form a unified entity (Siemens, 2004). However, the alteration of one of the components changes the whole (Siemens, 2004). Siemens has observed that the connectivist theory combines the fundamental aspects of network, chaos, self-organisation, and complexity theories (Siemens, 2004). In introducing connectivism as a digital age theory, Siemens maintained that it succeeds constructivist, behaviourist, and cognitivist theories (Bell, 2011). Further, Siemens claimed that the beginning point of the connectivist theory is the person, with personal knowledge being part of a network which augments the knowledge that organisations have contributed.

Downes (2008) affirmed that connectivism outlines how pedagogy and knowledge are based on the concept that information is available across “a network of connections and that learning consists of the ability to construct and traverse those networks” (p. 2). Eventually, this knowledge is fed back into the system which keeps on supplying knowledge and learning to the person (Siemens, 2004). This constant sequence of

knowledge growth allows the individual to stay up-to-date in his/her specific field due to the prior connections that have already been created (Siemens, 2004).

Furthermore, Siemens (2004) claimed that learning takes place within obscure environments whose main central elements are always changing and moving and which cannot be regulated by the learner. Learning may be located outside the individual and contained in a database or organisation (Siemens, 2004). From a connectivist perspective, the focus of learning is on the possibility to make the link between specialised sets of data, where the connections that facilitate learning in the individual are more valuable than the present condition of knowledge (Siemens, 2004). The connectivist theory has a fundamental stance the fact that since information is constantly changing, the individual's capacity to distinguish irrelevant information from important information is an essential skill (Siemens, 2004).

In the connectivist approach to learning, systems of knowledge are created to help substitute obsolete content with a more contemporary one (Siemens, 2006). Additionally, the concept of knowledge is usually understood as a sequence of expressions, representations and signs related to a foreign reality which is reflected in those expressions (Downes, 2012). Even more, the connectivist theory is based on the principles that knowledge and learning may be contained in non-human devices; the skill to expand knowledge is more important than the present state of knowledge; and that knowledge is based on varied opinions (Siemens, 2004).

Siemens (2004) introduced a framework which recognises the substantial society changes where learning is not an internal activity anymore; the capacity to distinguish what needs to be learnt tomorrow is more relevant than the current state of knowledge. Additionally, when knowledge is required, the capacity to connect to those sources of knowledge is an important ability (Siemens, 2004). However, due to the constant expansion and evolution of knowledge, the possibility to access necessary material is a more valuable factor than the individual's present state of knowledge (Siemens, 2004). However, and despite the advantages expressed by Siemens about his theory, according to his critics connectivism should be placed at curriculum level as opposed to theory (Bell, 2011). This is because to attain the theory level, additional development and explanation is necessary, which is only achieved by further research that will assess its practicality (Bell, 2011).

This chapter has presented the different theories that contributed to delineating this research. Vygotsky's (1978) theory of social constructivism was addressed, focusing on

the importance of the zone of proximal development. Additionally, the theory of social interdependence (Johnson & Johnson, 1989) clarifies how learning with others is the result of cooperative efforts. Piaget's (1952) theory was also explored, concentrating on the different developmental stages that individuals go through. Further, the connectivist theory proposed by Siemens (2004) described how the individual is and becomes part of a network of knowledge which is constantly changing. Based on these theories, this research explored Chilean pre-service English teachers' perceptions of cooperative group work and how individuals learn in them. Further, the use of a case study approach facilitated gaining in-depth insight into how individuals construct knowledge socially.

4. Research methods

This chapter presents the design that was used to enable an in-depth exploration of the phenomenon to be studied. It starts with a presentation of the study design that shaped this research, illustrating the different phases this qualitative research went through. Additionally, participants' recruitment and sample selection are described. Further, the induction process into cooperative work for the teachers and groups of participants is addressed. In addition to that, both quantitative and qualitative data collection methods are described. Data were collected from different sources and involved both quantitative and qualitative data. These included an adapted version of the Cooperative Learning Questionnaire to measure cooperative work in virtual environments and in face-to-face interactions, and the design and creation of an achievement test (see Appendix 3). One-on-one interviews and focus groups were used as well. The validation process of the achievement test and modified Cooperative Learning Questionnaire are explained. Qualitative data sources and how they were obtained from interviews and focus groups are discussed. The chapter concludes with a description of the way in which these data were analysed.

4.1 Case study approach

Case studies have been widely used in qualitative research to help increase the knowledge of social, political, group, and individual phenomena. Further, case study is a research strategy that is commonly used in sociology, psychology, and social work (Yin, 2009). A case study approach is used because it enables the holistic understanding of everyday life situations and complicated social events while retaining its essential features (Yin, 2009). In deciding if a case study methodology is the most appropriate approach to understand a specific phenomenon, there are five elements to be considered (Yin, 2009). The first element is related to the *study questions*. The type of questions included in a particular research project help determine whether a case study is the best option to be used (Yin, 2009). The second element is the *study propositions*. This implies that each study premise requires focusing on a specific aspect that will be addressed within the boundaries of that specific research (Yin, 2009). The third element relates to the *unit of analysis* which implies defining and delineating the case itself (Yin, 2009). The case does not necessarily need to be an individual, but it can also include several participants as in a multiple-case study. However, the use of the study propositions are important guidelines which help determine what information to be collected is relevant (Yin, 2009). Finally,

linking data to propositions and the *criteria for interpreting the findings* are the fourth and fifth elements that have been developed the least when it comes to the use of case studies for research (Yin, 2009). It is proposed that linking data to propositions can be done in varied ways, but the most accurate way relates to “the assignment of subjects and treatment conditions in psychological experiments” (Yin, 2009, p. 26). The criteria for interpreting findings has not been precisely defined. Further, it is expected that at least two patterns contrast enough for the findings to be interpreted in relation to the two rival propositions (Yin, 2009).

One case study may include multiple sub-units of analysis; this is known as an “embedded design” (Yin, 2009, p. 53). This research is founded on a multiple case study design comprising two case studies, with two embedded units of analysis within each case. The first case study focused on the interactions of the teacher and her group in the virtual environment of Second Life. The second case study focused on the interactions of the teacher and her group within a face-to-face environment. Both teachers were working in cooperatively structured groups. Figure 4.1 shows the multiple case study methodology used in this study.

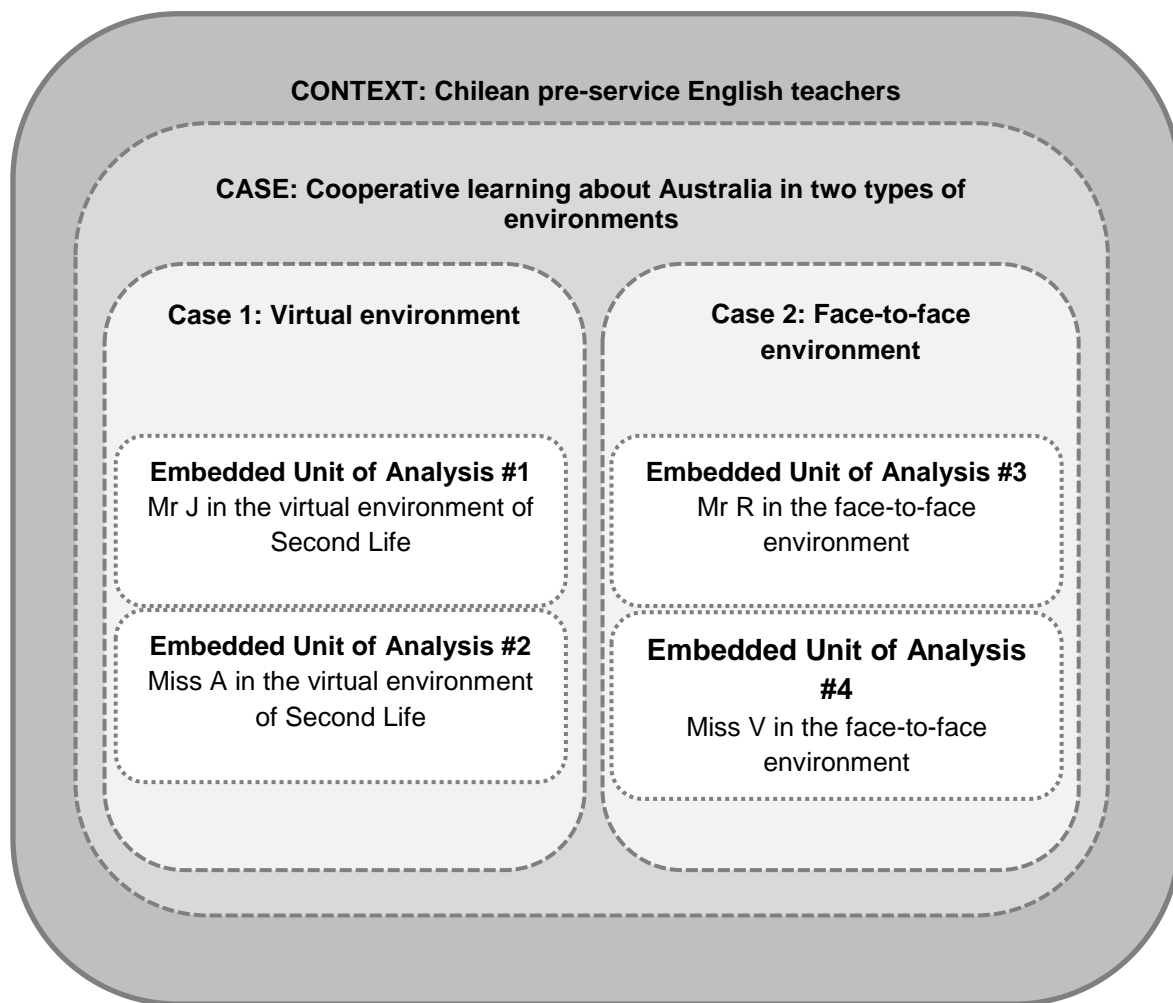


Figure 4.1 Methodology Summary

According to Creswell (2007) a case study is a qualitative data collection method which requires the researcher to examine one or many cases through comprehensive and careful gathering of data from different sources, namely, interviews, documents, reports, audiovisual material, and observations. Similarly, according to Yin (2009) case study evidence is not restricted to archival records, observations, interviews, and physical artifacts but also many other sources. He argues further that three principles need to be involved to conduct high-quality case studies, namely, keeping an evidence chain; setting up a case study database; including varied sources of information (Yin, 2009). These three principles are relevant to the six sources of evidence previously mentioned, and should be followed whenever possible. In addition to that, a case study methodology is used because it helps to thoroughly comprehend a real-life phenomenon which is circumscribed to relevant contextual circumstances (Yin, 2009). Thus, to get an insight into this, the qualitative researcher chooses participants and locations with that specific purpose (Creswell, 2012).

In the collection of data from a qualitative approach, there are five steps to be followed (Creswell, 2012). These steps are in a pre-established order, namely: the identification of participants and locations by means of purposeful sampling; accessing participants and places to start the study; data collection through observations, documents, and interviews; and data recording. Finally, there is the use of specific procedures to collect qualitative data which includes ethical issues aspects (such as maintaining confidentiality or sharing information with participants) that are related to collecting information face-to-face (Creswell, 2012). Additionally, Creswell has established that the use of a qualitative method implies that there is no intention to make generalisations to a complete population, but to investigate a specific phenomenon in-depth. In Creswell's view, one characteristic of qualitative data collection is to identify the kinds of data that will allow the researcher to answer the research questions. These data could include observations, interviews and questionnaires, documents, and audiovisual materials.

For the present study, purposeful sampling was used because the selected individuals helped the researcher to learn and understand a central phenomenon in a better way (Creswell, 2012). In this case, the phenomenon to be studied was related to pre-service teachers' perceptions of cooperative work to learn about Australia in two types of environments: the VW of Second Life and face-to-face. Barbour (2001) states that purposive sampling allows for the data to be interrogated purposefully with the intention of carrying out a systematic comparison. The rationale behind and the strength in using purposeful sampling is based on choosing information-rich cases which allow a clearer understanding and learning of pivotal aspects related to the study being conducted (Patton, 1990).

4.2 Study design

This study made use of a qualitative case study approach which followed different stages. Each one of them followed a logical sequential order. These different stages are shown in Figure 4.2.

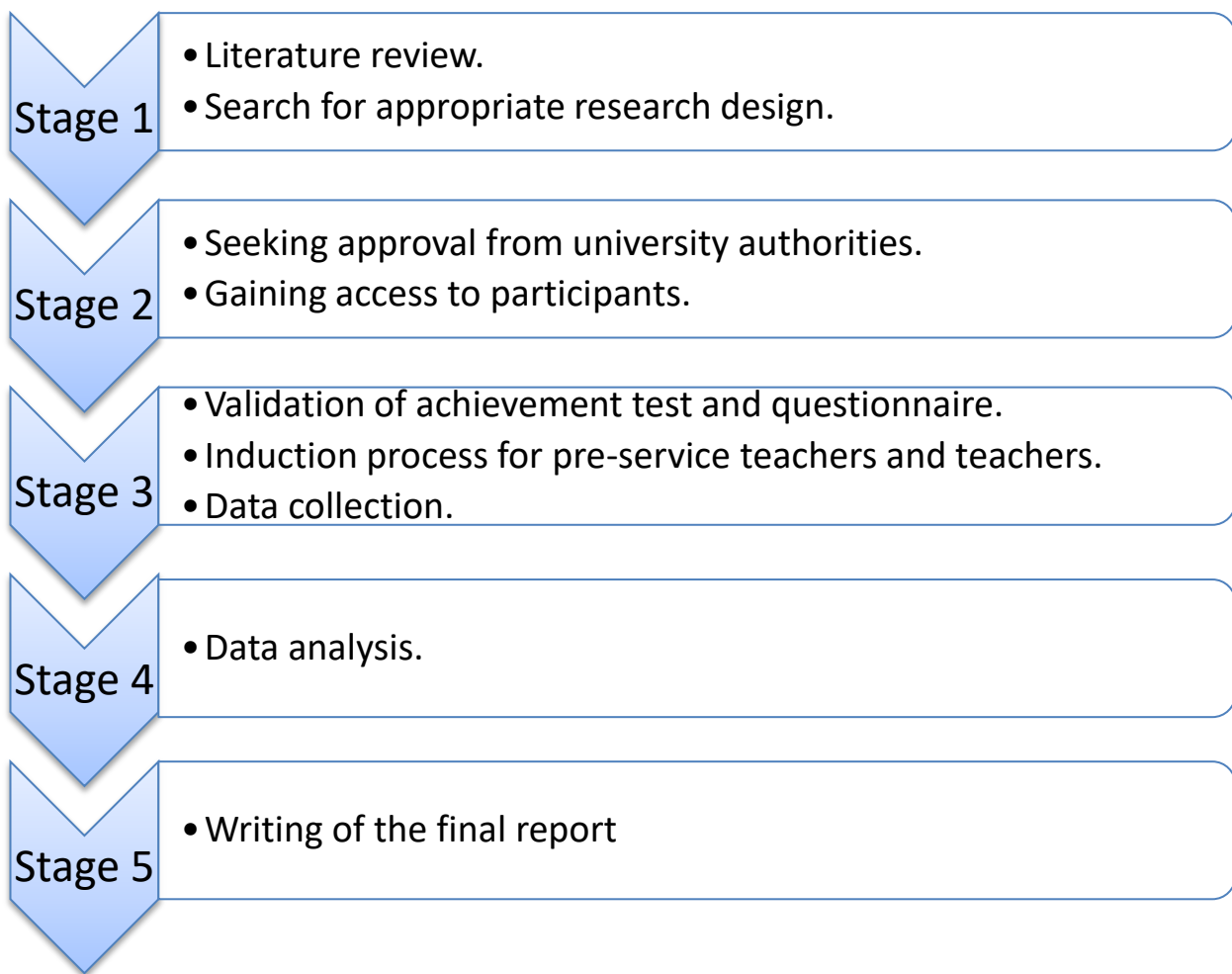


Figure 4.2 The five-stage process of the study

The first stage of the research procedure was to select an appropriate methodological design. To achieve this aim, the relationship between intent and the research problem was defined through an in-depth review of the literature. The aim of conducting a literature review was to develop a theoretical framework with clear guidelines about what needs to be addressed to implement a cooperative approach both in a face-to-face and in a 3D virtual environment. The theories of connectivism (Siemens, 2004), social interdependence (Johnson & Johnson, 2009), social-constructivism (Vygotsky, 1978), and cognitive development (Piaget, 1952) were used. The literature review also helped to identify the research gaps that this study contributed to filling.

The second stage was related to seeking access and getting approval to approach participants and study sites. This included obtaining authorisation from the institution's review committee (see Appendices 4 and 5). The research site and participants were located by using purposeful sampling procedures. The number of cases to be included

was determined; gatekeeper identification was conducted so as to have access to the sample. Provisions for respecting the site were defined. Receiving authorities' approval and gaining access to participants and study locations constituted the setting of the stage for the whole study. Meetings with university authorities were held and permissions were granted. Purposeful sampling allowed finding individuals and sites which helped the researcher to understand the phenomenon under study in the best possible way (Creswell, 2012). It was also important to identify those individuals, both teachers and students, who would participate, making use of purposeful sampling techniques.

The third stage was to collect the data itself, emphasising the inclusion of varied sources of collaboration and information as well as time spent in the study sites. There was extensive gathering of information which included audio/visual material, and numerous ways of data collection, namely, documents (questionnaire, achievement test), interviews, and observations. There was the planning of sixteen lessons for both types of environments, covering two units related to Australia, namely, the Sydney Opera House and the social circumstances under which it was built, and Uluru and the "Kata Tjuta" National Parks and their importance for all Australian citizens (see Appendix 5). These units were planned in accordance with the textbook students were using in one of their courses "History and language of English speaking countries" as previously mentioned.

This planning was designed following a cooperative approach. The planning also included induction processes for both teachers and students. The validation of the instruments that allowed the collection of quantitative data was also an important aspect to be considered. The achievement test was validated by using Lawshe's (1975) content validity index method. This method consisted of sending the test to be validated to a panel of teacher-experts who assessed its items in terms of clarity and congruency in relation to the content being measured (Lawshe, 1975). The suggestions made by teacher-experts were then incorporated into the final instrument that was given to participants. Similarly, the modified version of the Cooperative Learning Questionnaire was validated by applying the Cronbach's alpha test to measure its internal consistency. As the sessions began in both types of environments (virtual and face-to-face), teachers and students were interviewed to gain insight into their perceptions of cooperative group work and the teacher's role. This stage also included the administration of both validated instruments previously mentioned.

The fourth stage involved the examination of the data. Data were analysed to develop an overall understanding. The cases were comprehensively described, including a delimited

context for their description. Essential themes and issues pertaining to the cases were developed. This stage included thematic analysis and coding of the information contained in the interviews and focus groups. It also included the statistical analysis of both the achievement test on Australia and the Cooperative Learning Questionnaire.

The fifth and final stage involved writing a report which included descriptions, analyses and interpretations of the different data collected throughout the study. The planning of the previously mentioned stages were driven by a logical sequential process which is known as the “scientific method”, and which, when applied today, provides the foundation for educational research (Creswell, 2012). As indicated at the end of the literature review chapter, this study was guided by primary and secondary research questions which emerged from the revision of the current literature and the gaps that were identified. Each of these questions was addressed from either a qualitative or quantitative perspective as shown in Table 4.1.

Table 4.1. Research questions and data sources

Primary research question	Data source
1) What difference does the use of a 3D virtual environment make to cooperative learning when teaching about Australian historical events and geographical information to Chilean pre-service teachers?	Qualitative. Interviews and focus groups
2) How effective is the use of a 3D virtual approach to teaching about historical events when compared to a face-to-face, cooperative learning approach?	Quantitative. Achievement test and Cooperative Learning Questionnaire.
3) What effect does the teacher have in virtual environments (Second Life) to learning?	Qualitative. Interviews and focus groups.
4) What are the students’ perceptions of the role of the teacher in virtual environments (SL) and in face-to-face contexts?	Qualitative. Interviews and focus groups.
Secondary research question	Data source
1) What are the differences between students’ learning in a traditional face-to-face cooperative learning environment versus an online 3D cooperative learning environment?	Qualitative. Interviews and focus groups.
2) Does learning occur to a greater degree in a 3D virtual world or in a face-to-face structured cooperative group?	Quantitative. Achievement test and Cooperative Learning Questionnaire.
3) Are there specific aspects of teacher guidance that students perceive as contributing to their learning of cultural knowledge and cooperative work in virtual environments, Second Life?	Qualitative. Interviews and focus groups.

4.3 Participants

Participants were contacted and recruited in Chile to start with the data collection. This was done in advance by sending emails to the general e-mail list that the university had for each of the cohorts. Additionally, teachers were asked to suggest names of students with good academic and language skills (certified by one of the tests included in the ALTE framework). Based on their academic achievements and the close contact students established with teachers due to the advisory system the university has (teachers are in charge of monitoring students' progress and hold regular meetings with them), several names were proposed. Further, the use of purposeful sampling (Creswell, 2012) as a recruiting method allowed identifying students who were genuinely interested in becoming part of the study. Participants' enthusiasm and commitment was reflected in their constant engagement and participation throughout the sessions once the data collection process had started. This confirmed that their interest to be part of this study was motivated by their desire to improve their pre-service preparation.

As previously explained, students' recruitment was done by means of purposeful sampling as it allows intentional identification and selection of individuals and sites in order to learn or understand the central phenomenon; the use of purposeful sampling applies to both sites and participants (Creswell, 2012). When choosing individuals to be part of a case study, sometimes the selection is straightforward because a unique case has been chosen whose identity has been easy to establish from the outset of the inquiry (Yin, 2009). At other times, there may be many qualified case study candidates who can be chosen for the final case study. The screening procedure assured that the final cases are properly identified prior to formal data collection (Yin, 2009). The screening process usually consists of gathering an appropriate amount of data which helps decide whether the individual can provide useful information to get an in-depth understanding of the phenomenon under study (Yin, 2009).

4.3.1 The sample

The result of the recruitment process yielded 39 students from a pool of approximately 60 for the cohort which met the language requirements that had been established. Participants' average age was 20 years old. Twenty-one of those participants formed the group which worked in the virtual environment of Second Life. The other eighteen participants decided to work in the face-to-face group. Group composition was the result of

participants' preferences to work cooperatively in each type of environment based on their computer expertise or personal preference to work face-to-face.

In the group working virtually, gender composition was 7 female students (representing 33% of the sample group) and 14 male students (representing 64% of the sample group). As explained above, grouping was based on their individual preferences. In the case of the face-to-face group there were 9 female students (representing 50% of the sample) and 9 male students (representing 50% of the sample). The other participants were the two female full-time teachers who taught in each group.

Once recruiting was completed, there was a general meeting with all of the students who were going to participate in the project. The research objectives were explained to the participants highlighting the contribution to the field that this project represents. Questions about technical aspects students had were answered. In this meeting, all of the participating students were briefed on what cooperative learning is; the way in which the teachers were going to organise the groups and sessions; and how they were to work cooperatively. Meeting days were worked out so as to align the sessions to their academic schedules. There was a series of e-mails so as to cater for those students who had had last-minute changes in their academic schedules. In the end, all participants were able to meet twice a week on agreed days.

4.4 Participants' induction process

Both the teachers and students required some preparation to work under a cooperative approach and in Second Life. Thus, there was an induction process for both teachers and those students working in the virtual environment. This involved regular meetings with the teachers to introduce them to the notion of cooperative work and the use of a cooperative approach for teaching. The induction with the students in the virtual group included familiarising them with the virtual platform of Second Life.

4.4.1 The teachers

The two teachers who participated in the project were contacted in advance. One of them, Miss A, 40, who taught in the virtual environment of Second Life, had been a teacher of English for fifteen years and she had worked with different types of people including teaching English to small children, adolescents and also adults. She has worked mainly in schools, and so has expertise in this area as well as in other educational roles. She worked in different projects for nine years in a private bilingual school in Concepcion, her

hometown. She has also worked with adults in a language institute in the same city. Now she is the head of the English program at the educational institution where this research took place. She is in the final stage of obtaining her masters in administration, because her work at university is mainly administrative. She also has a CAE certification by Cambridge University and very recently became an international examiner for the University of Cambridge in her hometown.

The other academic who taught in the face-to-face group, Miss V, is a 40 year old teacher who had been teaching for fourteen years. She had taught primary and secondary students mostly in private bilingual schools and had been teaching for seven years at university level. She was head teacher in primary level from 1 to 4, teaching English, social science, science, math and arts in two private bilingual schools in her hometown, Concepcion. She was also head of the English department at a private bilingual school where she had to supervise six other teachers, from pre-school to secondary, and also choose the textbooks and lead the English bilingual program. She is currently working on the final stage of her masters program in curriculum and evaluation (assessment) and starting another masters program in higher education pedagogy. She has also taken diploma courses in philosophy, and pedagogy (Higher Education Pedagogy).

4.4.1.1 Induction process for teachers

Both teachers went through an induction process which consisted of regular meetings with the researcher. These meetings were held for two weeks. The researcher and teachers agreed to meet for 40 minutes each day from 17:00 to 17:40 for a period of ten days in accordance with the time they had available and their administrative duties. In the case of the teacher who would work in the virtual environment, the meeting lasted another extra thirty minutes because it was necessary for her to know about Salmon's (2011) five stages on how to establish an online working environment, namely: access and motivation, online socialisation, information exchange, knowledge construction and development (Salmon, 2011). In these meetings, the teachers were introduced to two books that were the basis for their preparation, namely, *E- moderating: The key to online teaching and learning* by Salmon and *Cooperative learning: Integrating theory and practice* by Gillies (2007). Both books present ideas and activities that guided them in establishing structured cooperative groups as well as teaching and learning online. These meetings were conducted with the aim of introducing the notion of and familiarising both teachers with the cooperative approach to teaching and learning. Further, the discussion and clarification of aspects related to the different stages in structuring a cooperative learning group were also

addressed, so that they were able to apply them when teaching throughout the sixteen different lessons that this project comprehended.

The first induction session for both teachers started at 17:00. In this session, the teachers and the researcher discussed what cooperative learning meant for them and by the end of it the definition of cooperation by Johnson, Johnson and Holubec (1998) was introduced. After the session was over, the researcher kept on working with the virtual teacher and introduced her to the five-stage model proposed by Salmon (2011) as shown in Table 4.2.

Table 4.2 Salmon's (2011) five-stage model for e-moderating.

Stage	Description
1) Access and motivation	<p>At this stage, participants need the necessary technical support to access the online environment as well as the motivation. Participants should have a clear understanding of the benefits of accessing the system. They need to install the necessary software, create username and password, and access the virtual environment where the conferences are taking place.</p>
2) Online socialisation	<p>At this stage, participants should get accustomed to be in the online environment. They also need to recognise the need to identify with others to establish a sense of direction and construct and exchange knowledge online.</p> <p>At this stage, teachers are encouraged to create a psychologically 'safe' climate that enables every participant to express themselves but with respect and appreciation for the unique qualities of others, their experiences, and the avoidance of stereotyping or labelling.</p>
3) Information exchange	<p>At this stage, participants begin to value the access they have to the varied sources of information they have online. The cost of responding to information request is non-existent; hence the exchange of information starts to gain momentum. The role of the e-moderator is to foster participants' independence and confidence to work online. Assigning specific roles to participants and ensuring there is active participation is part of this stage.</p>
4) Knowledge construction	<p>Interaction among participants starts to take place at this stage in a more explicit way; they start to share their ideas of the topic under discussion. There is constant response to other participants' messages. Debate plays an important role to foster students' understanding of theories and concepts. When this process has started it has its own energy and strength.</p>
5) Development	<p>Participant's accountability for their own learning is achieved by using technology-enhanced learning and no much support is needed. At this stage, the ability to defy what is taken for granted and the development of critical thinking skills come into play. Further, participants may ask for more software, prompt replies, and better access; they also tend to resist system changes as well as down time.</p>

Throughout the sessions, the VE teacher was introduced to the notion of Salmon's (2011) five stages. In this first session, the VE teacher was introduced to the *access and motivation* stage; which was the focus of attention for the session. There was clarification and discussion of the most important aspects that this stage comprehends. It was also relevant to consider the risk of students being exposed to inappropriate material or conduct in-world (that is, within the VW of Second Life). It was agreed that whenever such a situation arose, the teacher would teleport (that is, transport the avatar to another place in-world) to the student straight away.

In session number two, both teachers were introduced to the five elements that comprise the establishment of cooperative learning, namely: positive interdependence; individual accountability; promotive interaction; appropriate use of social skills; and group processing (Johnson & Johnson, 1989). Each one of these elements was examined comprehensively and doubts were clarified by using the book *Cooperative learning: Integrating theory and practice* (Gillies, 2007) as a reference and complementary material. There was also discussion and clarification of the role teachers have in establishing a cooperative learning setting. Again the book by Gillies was used as a constant reference. During this session stage number one, *access and motivation*, of the model proposed by Salmon (2011) was discussed with the virtual teacher. The book *E-moderating: The key to online teaching and learning*, by Salmon was used as the constant reference to clarify any doubt the virtual teacher had on how to create the appropriate setting for online learning. Also during this session, the virtual teacher created her account on Second Life and had, for the first time, a look at the environment and the different islands in-world. She chose her avatar and guidance was offered on the process of its customisation to make it look the way she wanted.

In session number three, conversation with both teachers about the establishment of a cooperative learning environment was resumed. It revolved around the five different aspects that must be present and set up by the teacher to create a structured cooperative learning environment. Again, the five components were revised and both teachers were asked to think about how they would make use of each one of them in teaching situations. Teachers also reflected on the use of previous cooperative learning experiences they may have had without being aware of it. Both teachers shared their experiences and made the connection with the information on how to establish cooperative work that they were analysing. With the virtual teacher, there was a review of the previous session's information and the second stage in the model proposed by Salmon (2011) *online*

socialisation was covered. There was an analysis and conversation of what this stage entails: to make participants get familiar with the interaction that takes place in an online environment. Content of Salmon's book was important to expand the virtual teacher's knowledge on how to establish this essential stage for online learning. In the Second Life environment, the teacher started exploring the initiation island "Lionheart Pumbaa" which is a place that provides participants with the basic skills that are necessary to move around the Second Life environment.

In session number four, previous information with both teachers was revised. Then there was an extensive discussion about the *key elements of successful cooperative learning* based on the book by Gillies (2007). The different components of cooperation were reviewed by both teachers. After this, the virtual teacher kept on expanding her knowledge about the second stage in Salmon's (2011) model: *online socialisation*. In the Second Life environment, the virtual teacher started manipulating objects. She also learnt how to landmark places, sit and fly. A landmark in Second Life is a shortcut that allows members to quickly return to a desired location. The virtual teacher declared that "[Second Life] seems to be so real and you feel so involved in what the avatar is doing".

In session number five, previous information on establishing a cooperative learning environment was discussed and revised with both teachers. When the question of "How long should students work in cooperative groups?" was discussed, the conversation was centred on the stages proposed by Tuckman (1965) as shown in Table 4.3.

Table 4.3 Tuckman's (1965, p. 66) four stage model for developmental sequence in small groups.

Stage	Description
1) Forming	It is characterised by members' experiencing some uncertainty as they begin to work out what they need to do to accomplish the task. Initial phase lacking in structure.
2) Storming	It is characterised by members often experiencing some tension as they work through their ideas on accomplishing the task. This early phase features hostility and conflicts between subgroups.
3) Performing and Norming	It is the probably the most productive as members settle down and work on accomplishing the task at hand. It is a 'mature' stage in which criteria are determined and there is obvious interdependency and trust.
4) Adjourning	Members realise that they have accomplished the task and it is time to move on. This stage has also been described as a 'mourning' stage because group members may feel somewhat saddened by the breakup of the group. There is termination, concerned with disengagement and ending.

In many cooperative learning situations, groups tend to last no longer than 4 to 6 weeks, which seems to be an ideal length of time to work together. After having discussed these stages, the meeting went on with the virtual teacher, with an analysis of stage number 3: *information exchange*. This time in the initiation island, the teacher tried the “camera control” feature. The camera control in Second Life allows participants to change the avatar’s angle of view and grants the possibility to look around in a more comprehensive way.

In session number six the focus with both teachers was on “*teachers’ responsibilities in establishing cooperative learning*” and the key elements that a teacher should make use of to assure cooperation is being used. This was based on the information contained in the book by Gillies (2007). Teachers showed increased enthusiasm to know more exhaustively about what their role in establishing cooperation was. With the virtual teacher, discussion about stage number 3, *information exchange*, from Salmon’s (2011) model was resumed. After talking about the theoretical aspect, there was the practical component in the VW of Second Life itself. The teacher was teleported to the “Australia” island in Second Life and had the chance to have a look at the Sydney Opera House. The virtual teacher expressed that she was amazed at the realistic representation of this building and its surroundings.

Session number seven focused on reviewing the different aspects related to the establishment of cooperation covered so far. The topic of *the teacher’s role in promoting mediated learning* was presented and discussed. Teachers have to explicitly teach the thinking abilities they want students to use in their dialogic interactions (Gillies & Boyle, 2005). The meeting continued with the virtual teacher, discussing stage number 4 *knowledge construction*. Again the Australia island in Second Life was visited by her. This time, the teacher gained more experience with the teleportation feature that Second Life has.

In session number eight, the topic of *monitoring students’ progress and evaluating outcomes* was discussed based on the book *Cooperative learning: Integrating theory and practice* (Gillies, 2007). Another topic that both teachers and the researcher focused on was related to strategies to help students establish dialogue. For this reason, the “reciprocal teaching” strategies in the book by Gillies were discussed. With the virtual teacher, the information covered the day before about stage number 4, *knowledge construction*, was resumed. The term “weaving” was introduced as it is important for the

virtual teacher to be aware of her responsibility to pull together the ongoing conversation. This time in Second Life, the Uluru island was visited; this is the other topic taught and covered by the teacher.

In the penultimate session, *scripted cooperation* was covered with both teachers. Scripted cooperation involves asking students to work together to acquire information about the task (Gillies, 2007). Teachers were introduced to the ASK to THINK-TEL WHY (King, 1997) that has been characterised as an inquiry-based framework for students to learn with their peers (Gillies, 2007). With the virtual teacher, there was a review of previous contents and stages in Salmon's (2011) book. After the revision, stage number 5 *development* in Salmon's model was covered. This time in Second Life, other islands were visited and the teacher was able to get "freebies" to edit her appearance. A freebie in the Second Life environment refers to free items such as clothes or accessories that users can employ to edit the avatar's physical appearance.

In session number ten, the final aspect of "*Self-Regulated Strategy Development*" (Gillies, 2007) was covered. This is an approach to help students improve their writing performance by teaching them specific strategies. The final meeting with the virtual teacher took place and there was a general review of the key concepts and ideas that had been covered the previous days. This time in Second Life the virtual teacher accessed the Sydney Opera House and Uluru islands in-world. She went and visited the site and seemed to be comfortable moving around, walking, flying, and teleporting.

With both teachers, a general review of all of the information related to establishing a cooperative and online work environment was made. All the key concepts revised during the 10 days that the sessions were held for were reviewed. A digital and hard copy of all of the information covered in the different sessions was provided to both teachers; something they found very valuable for future reference.

4.4.2 Induction process for students working in the virtual environment

After both groups were formed, students were presented with the notion of what working cooperatively is all about. It was also necessary to give those students working in the virtual environment an induction process which lasted one week. This was done by the researcher in the presence of the virtual teacher. It was important to explain to the participants that there was a possibility for them to encounter some inappropriate material and behaviours in-world. Students were briefed that whenever such situation arose, they

should contact the teacher and ask to be teleported out of the island where they were. The virtual teacher was present throughout the sessions and she knew what to do if something like this may happen. The induction process that took place with the participants is described below.

The induction with the virtual students included a participation in “Lionheart Pumbaa”, an initiation island which had already been created in Second Life. Familiarising themselves with the different activities, they had access which allowed participants to learn the basic skills they needed to move freely in Second Life such as walking, running, flying, teleporting and moving objects as well as editing the avatar’s appearance. In the Second Life environment, users have the option to edit the avatar’s physical appearance and clothing. Avatars can also perform activities such as flying, teleporting, and moving objects which are beyond the capabilities of the physical environment’s rules. Students were given freedom of choice to select the type of avatar they wanted (animals, machines, vampires, humans, etc.) from the ones that are available in the Second Life environment.

In the first session that took place at “Lionheart” students felt a bit anxious and insecure from what it was possible to tell based on their chat comments. The researcher had previously sent them an e-mail with the link to the initiation island “Lionheart” so that they could be teleported there. Most of them were there at the agreed time and other ones arrived later on. Due to their erratic avatar movements, it was possible to tell that it was their first time in this type of environment; they were bumping into each other and even against the walls. The audio feature of Second Life was tested, but due to internet connection as well as the use of headphones, whenever this was activated, the whole system turned very slow. It was therefore decided that the chat channel (the text option to communicate) that Second Life offers was going to be used. This first session took 50 minutes approximately and the researcher was there to help them do the different activities that were proposed on the island such as manipulate objects, landmark a place, edit the avatar’s appearance, run, and fly. After half an hour there, students seemed to be enjoying themselves and by the end of the session, you could tell that they had gained a bit of experience in this type of environment as their movements were smoother and they seemed to walk and act more evenly.

The second session also took place in the same initiation island. This time, from the beginning it was possible to see the avatars walking with ease. Some of them had new appearances; they had been edited by the students in their own time. Student avatars

appeared in-world at the agreed time and kept on exploring and going around the place trying other features and taking on tasks such as “camera control”. This feature allows changing the view angles without moving the avatar and by using the keyboard arrows. Avatars were moving around and interacting with objects, jumping, and so forth. This second time the audio feature was tested by using headphones. Unfortunately, once again the system was very slow, so it was agreed that the chat channel option was going to be used from then on. Despite this, students were happy to be gaining access and mastering the place, which is step one in the framework proposed by Salmon (2011) “access and motivation”.

In session number three, students were encouraged to landmark the initiation island “Lionheart” (to return there afterwards) and explore other different islands in-world. Students were asked to landmark “Lionheart” for future visits and explore it in their own time. While on the initiation island, students were asked to read about “billing information”, “buying Linden dollars”, “in-world economy”, and learn about “the Worldmap”. All this information was useful and available for participants to familiarise themselves even more with the Second Life environment. This information was accessible on different boards along the hallways and areas on “Lionheart” island. Participants were coming from and going to other different places. Some of them did not know how to return to the initiation island so they asked for help to be teleported back through the chat channel they all shared. This whole process fostered online socialisation, as it is the second stage in Salmon’s model (2011) which gives them more confidence and helps them develop a sense of belonging and identity that was going to be required for the coming sessions.

In session number four students felt more at ease. This was inferred from their comments on the chat channel. They were jumping, sitting on the ground, editing their appearances and manipulating objects on the initiation island. Some of the students mentioned on the chat channel that they had played games which resemble Second Life such as “Doom”. In general, students seemed to be moving around comfortably with their newly-found “selves”.

Final session and the researcher’s general perception was that students were all set to go. They had mastered the basic skills of moving around freely and without any difficulties. It was possible to see them moving objects, editing their appearance, walking, teleporting and flying. In the chat channel, they expressed that they felt bit scared at the beginning,

but they ended up feeling more confident to face the challenge of learning about Australia and Uluru in the virtual environment.

4.5 Data collection methods

Data sources involved quantitative and qualitative information. These included the Cooperative Learning Questionnaire to measure cooperative work in virtual environments and in face-to-face interactions. It also included the design and creation of an achievement test and one-on-one and focus group interviews.

4.5.1 Quantitative instruments validation process

In the embedded case study that was conducted, besides the qualitative information obtained from the interviews and focus groups, quantitative data was also gathered to support and triangulate the information. This information was gathered by means of applying the Cooperative Learning Questionnaire and the achievement test. The achievement test was specially created to measure the learning in relation to the two units on Australian historical events and geographical information planned for this study. The two units covered the topics of the Sydney Opera House and Uluru and included different objectives and activities for each class. They were planned considering the availability of resources that students had access to in the Second Life and face-to-face environments. The units were also planned in agreement with the textbook being used in the subject "History and language of English speaking countries" that was part of the syllabus of the pre-service teachers who participated in the study. The planned units followed a logical sequential order starting with general information to, then, focusing on more specific details. The activities considered for each of the two units were student-centred and posed activities in which students had to look for information making use of different resources for the face-to-face and virtual group. The face-to-face group had access to videos, websites, and online encyclopaedias. The virtual group searched for information in-world, exploring the island and obtaining information from other residents and areas within Second Life.

4.5.1.1 Achievement test

For this study, a forty-item achievement test was specially designed to assess students' development of their cultural awareness of English-speaking nations outside the US and UK (see Appendix 3). The test was made up of two sections with 20 multiple choice items each. The first part was aimed at assessing how much they knew about the Sydney Opera House. The second part of the test was aimed at assessing how much they knew about

Uluru and the Kata Tjuta National Parks. Items for the first part of the test included questions like “Which event happened in the year 1966 that is related to the Opera House?”, “How long did the construction of the Opera House take?” and “Under which circumstances did the Opera House building come to be?” For the second part of it, questions like “What does the word Uluru mean?”, “What is “Tjukurpa”?”, and “What part do ceremonies play in the passing on of knowledge for the local people?” were included.

The instrument designed to assess the learning from the two units considered the four steps recommended by Benson and Clark (1983), namely: planning, construction, quantitative evaluation and validation. The planning phase began with the consideration of the purpose of the instrument. This included the area that the instrument assessed as well as the target group for which it is intended (Benson & Clark, 1983). The construction of the instrument required a literature review to make sure that such an instrument did not exist. This also assisted in determining the items that would be used to gauge content learning as accurately as possible (Benson & Clark, 1983). The quantitative evaluation considers pilot testing the instrument by giving it to a group of participants. It is suggested that once the pilot study has been conducted there is a qualitative evaluation of the instrument (Benson & Clark, 1983). Validation of the instrument, the final step, may include a qualitative analysis of the items that compose the instrument. This may require the instrument to be evaluated considering how precise and clear each item is (Benson & Clark, 1983).

The planning of the achievement test was made considering the textbook students were using and the content in it. The instrument was prepared taking into consideration the objectives included in the lessons. The achievement test construction contemplated the fact that such an instrument does not exist in the current literature as it was specifically created for the purpose of this study. The quantitative and qualitative part of the instrument design was included within Lawshe’s (1975) validation process regarding the calculation of the content validity index (CVI) as explained below. Since it was not a standardised test, this instrument was analysed and evaluated by nine experts prior to participating students being asked to complete it. All of the experts were certified teachers of English with years of teaching experience as well as post-graduate studies as described (see Appendix 8).

The forty-item test were sent out to these nine experts to be revised and scrutinised together with the 16 lesson plan. The lesson plan contained the objectives to be achieved by the teachers for the two units. It provided detailed information about the contents to be

covered by the teachers. Experts had one week to examine the test and make their comments following the Lawshe (1975) method regarding content validity for the instrument. Participants were asked to assess the 40 different items in terms of congruency and clarity and make comments on those they did not find appropriate. The achievement test's CVI was calculated using the following formula:

$$CVI = \frac{Ne - N/2}{N/2}$$

In this formula, Ne represents the number of experts that considered the item to be essential and N represents the total number of experts that evaluated the item. According to Lawshe (1975), a CVI of 0.29 is appropriate when the total number of experts is 40. A CVI of 0.51 is appropriate when 14 experts assessed the items and a CVI of 0.99 is required when the number of experts is less than 7. Considering the number of experts that examined the test, its total CVI was 0.92 which showed that it was a valid instrument to be administered. Other than the appropriateness of the items, the nine experts made some other suggestions regarding wording and punctuation of the different statements on the test. All of these were taken into consideration and included in its final version.

4.5.1.2 Cooperative learning questionnaire

The Cooperative Learning Questionnaire (see Appendix 1) used in this study had been previously used and validated by Gillies and Ashman (1996) and is designed to explore students' capacity to work cooperatively. It is a three-part questionnaire with a Cronbach's alpha of 0.78. Cronbach's alpha is used to measure an instrument's internal consistency and it is expressed as a figure between the ranges of 0 and 1 (Tavakol & Dennick, 2011). An instrument's internal consistency shows that all items in test measure identical content (Tavakol & Dennick, 2011). Further, Cronbach's alpha is used especially when the instrument contains multiple Likert questions (Tavakol & Dennick, 2011) as was the case with the Cooperative Learning Questionnaire.

The first part of the Cooperative Learning Questionnaire consisted of nine items illustrating the essential components of cooperative learning. This part includes items such as "all the group members felt free to talk" or "people listened to one another" (Gillies, 2003, p. 144). The second part of the questionnaire, Motivation, Participation, and Attitude consisted of six different parts which are based on protocols established by Sharan and Shaulov (Gillies, 2003). It included items such as "group members like to do quality work", or "group members often do extra work outside the group" (Gillies, 2003, p. 144). The third part of

the questionnaire, Behaviour in the Small-Group was based on five different parts by Gillies and Ashman (1996) of students' and teachers' perceptions of cooperative behaviours (Gillies, 2003). It included items such as "group members place expectations on each other's behaviours", or "most students like to be responsible for their own group projects" (Gillies, 2003, p. 145).

The Cooperative Learning paper-based Questionnaire contained a Likert-type scale ranging from "this almost never happened, this seldom happened, this sometimes happened, this often happened, to this almost always happened". Participants had to circle their response from the five options presented.

For this study, and since the Cooperative Learning Questionnaire measures cooperative work in traditional face-to-face settings, it was necessary to adapt it for its use in measuring cooperation in virtual environments. The adaptation consisted of modifying the original questionnaire statements by including elements related to virtual environments (see Appendix 2). A testing and re-testing procedure was used with the instrument being given to 33 students who were not the same students who participated in the study, but were in their 3rd year out of 4 at an English teaching program at a Chilean university. In the first application of the modified Cooperative Learning Questionnaire, the Cronbach's alpha was 0.87. For the second application, with a two-week interval, the result was 0.91. These figures indicated that the modified instrument was still as reliable as the original for its use with students working in the VW as it has been stated that the coefficient obtained from a Cronbach alpha test should be higher than 0.7 (Pallant, 2011). In addition to these two instruments, one-on-one interviews, as well as focus groups interviews were conducted to gather qualitative data.

4.5.2 Qualitative sources of data

4.5.2.1 Interviews

The use of interviews constitutes a popular way to collect data in case study research. Interviewing groups or individuals permits researchers to obtain personalised, rich information (Mason, 2002). There are specific steps to be followed for an interview to be successful (Hancock & Algozzine, 2011). These include the adherence to ethical and legal requirements; identification of key participants; development of an interview protocol; consideration of an ideal setting; and the establishment of the way in which interview data will be recorded (Hancock & Algozzine, 2011).

The interviews conducted in this study were of the semi-structured type using follow up questions to examine more in-depth those elements that were of interest for the interviewees (see Appendix 7). The advantage in using semi-structured interviews is that participants had the flexibility to express their personal points of view according to their circumstances (Creswell, 2012). In a semi-structured interview, both the respondent and interviewer engage in a formal interview, but it is possible for the interviewer to follow up and ask about new topics that may arise, and stray from the originally planned questions (Creswell, 2012). Each interview was conducted in a friendly and comfortable environment (quiet place with appropriate furniture and tea and/or coffee for the interviewee), with each participant being individually interviewed. Interviews were planned to last no more than half an hour, but there were certain exceptions as the conversation itself and the follow-up questions sometimes took a bit longer.

This form of questioning was used because according to Hancock and Algozzine (2011) the use of semi-structured interviews “invite interviewees to express themselves openly and freely and to define the world from their own perspectives, not solely from the perspective of the researcher” (p. 40). Semi-structured interviews were an appropriate tool to obtain in-depth, meaningful information in this study because they allowed for the examination of attitudes, interests, feelings, concerns and values more easily than through observations (Gay & Airasian, 2006). When conducting an interview, a researcher should undertake some tasks. First, it should be ensured that the consent of the interviewee has been obtained. Second, the purpose of the interview should be reviewed with the interviewee. Finally, the researcher should refrain from making additional remarks so as to give the interviewee more time to explain his views on the specific topic of conversation (Hancock & Algozzine, 2011). Rapport should be also established with the respondent. Rapport can be achieved by becoming the teacher’s class assistant; in informal situations by interacting socially; or in formal situations by working collaboratively on different projects (Creswell, 2012). The establishment of rapport is essential considering that some participants may agree to be interviewed at first, but then decide to withdraw due to the time consuming nature of the interviews or the type of questions they are being asked (Bryman, 2012).

When designing the questions for the one-on-one interviews as well as the focus groups, the three proposed rules of thumb proposed by Bryman (2012) were considered, namely: “what do you want to know?”; “how would *you* answer it?”; and always “keep in mind your general research questions as a guide”. Interviews and focus groups were conducted at

the beginning, during, and after the whole process. They were held in English as students and teachers had the required language level. They were fully audio-taped for later transcription and analysis. Different themes emerged to answer the research questions. Questions asked to the face-to-face students included “Which aspects of teacher guidance would make a difference when learning cooperatively?”, “What do you think the role of a teacher is in a cooperative learning environment?”, and “Which aspects of teacher guidance would make a difference when learning cooperatively?” For those students working in the virtual environment questions asked included “What do you think a virtual learning environment is?”, “Do you think that there are different stages when learning in virtual environments?”, and “What do you think the role of the teacher is in a virtual cooperative learning environment?” In the first round of interviews, students came up with answers about what cooperative work is. From their answers, it was possible to infer that they also had an implicit knowledge of this approach.

In the case of the teachers, the one working in the face-to-face group was asked questions such as “What do you think are the teacher’s responsibilities in establishing cooperative learning?”, “How is a cooperative learning environment created?”, and “What do you think are the advantages/disadvantages of cooperative learning?” As for the teacher working in the virtual environment, she was asked the same questions but extra ones were included regarding virtual spaces. There were questions such as “Which is your level of user expertise as a computer user?”, and “How do you think ‘presence’ and ‘visibility’ are achieved in a virtual environment?” These questions were based on Salmon’s (2011) model. It also has to be mentioned that follow up questions were asked based on the interviewees’ answers such as “how did you feel about the sessions being student-centred rather than teacher-centred?”; “what is your overall assessment of the whole experience?”

4.5.2.2 Focus groups

Focus groups are used by researchers to collect qualitative data in interviews when the aim is to probe into participants’ perceptions, attitudes and feelings in relation to a selected subject (Puchta & Potter, 2004). In a focus group interview, the researcher participates mainly as a listener; group members are encouraged to ask questions, exchange information and comment on each other’s experiences and perspectives. The purpose of using focus groups in this study was to obtain information that participants do not feel comfortable disclosing when having a one-on-one interview. When group participants feel free to talk to each other, the researcher can obtain more valuable information than other

research methods cannot, revealing dimensions of understanding that often remain untapped by more traditional data collection techniques.

In this study, focus group participants were randomly selected from each group and their conversations video-taped and recorded for later transcription and analysis. For each of the focus groups that was held, there was one student who volunteered to play the role of the moderator. The group was placed in a room with the necessary conditions for the focus group to take place: a table, chairs, and a data projector to show the questions being discussed to the whole group. The student in charge started the focus group by giving some opening words about the activity itself and then proceeded to ask the questions one by one.

The questions asked in the focus groups revolved around the topic of cooperative learning and they were basically the same questions that were asked in the one-on-one interviews. Most of the time the student moderator initiated the conversation by giving his or her own answer first and the rest of the participants joined in the conversation and discussion expressing their opinions and ideas in relation to that question. There was a varied exchange of points of views, opinions and ideas as the moderator went through the different questions he/she read. The researcher was there to supervise the conversation and, occasionally, clarify or ask a follow-up question when necessary.

4.6 Data analysis

The quantitative information contained in the achievement test and the Cooperative Learning Questionnaire was analysed differently from the qualitative information contained in the interviews and focus groups. For the quantitative information obtained from the achievement test, an Analysis of Covariance (ANCOVA) was conducted. ANCOVA is used to measure the effect of two separate interventions; with a pre- and post-test being administered in two different groups (Pallant, 2011).

4.6.1 Data collected from both instruments

Once both instruments had been validated by means of the procedures previously stated, they were administered to the participating students. For the analysis of the achievement test, SPSS statistical software was used. Initial independent t-tests were conducted to determine whether the two groups' results in terms of content knowledge significantly differed on test at Time 1 (virtual group and face-to-face group). T-tests also permitted evaluation of whether the type of learning received influenced test results. To do this, an

ANCOVA was conducted to control for the Time 1 difference between groups. Test results revealed that the virtual group Time 2 score was significantly better than the face-to-face group Time 2 score.

4.6.2 Interviews

All the interviews were transcribed by the researcher and coded with the help of the NVivo software. After each interview and focus group discussion, the researcher transcribed them. This was done to identify what both teachers and students thought of cooperative learning and the use of this approach in both types of environments. A number of interviews with students participating in the virtual and face-to-face environments were conducted at the beginning, during, and at the end of the data collection process. Additionally, focus groups with all the students were held at the beginning, during, and at the end of the data collection process as well. More constant and in-depth interviews were held with the case study subjects. Interviews with the case study individuals were conducted until a clear picture and understanding of their perceptions of cooperation in both types of environments emerged.

Two elements must be included to conduct an analysis coding scheme, namely: planning a coding manual and agenda (Bryman, 2012). The former are the instructions for coders to follow which include all conceivable categories for each of the dimensions that are being coded. The latter is a form where all of the information related to one specific item will be entered (Bryman, 2012). The agenda provides an itemised categorisation of the dimensions to be considered; the varied categories included within each dimension; the numbers (i.e., of codes) corresponding to each category. It also provides guidance on what the different dimensions include and what factors determine the allocation of a specific code to each dimension (Bryman, 2012).

With the use of NVivo it is possible to categorise, code, retrieve and report on the data. Once coded, the use of nodes in NVivo allows varied sources of information to be grouped under a common theme. The data is stored at various nodes which interrelate, creating connections between the nodes' meaning and hierarchy. Additionally, in NVivo it is possible to view a summary of the most common words as well as a tree map (a set of rectangular diagrams displaying data hierarchically), and a cluster analysis (the possibility to create a graphical representation of nodes and sources sharing related words). This provides flexibility to reorganise the categories and interpretations over time. There was an inductive coding in which there was the creation of a list of the most common concepts

that represented the connections in the data. After these bigger categories or “free nodes” were established, there was the creation of sub-categories each one representing an aspect of the free node. So, for example, for the free node *definition of cooperation*, it was coded as:

- Advantages and disadvantages of cooperation
- Teacher’s role
- Aspects of teacher guidance in cooperative learning

These categories represented the issues students came up with in the interviews. These sub-categories are termed “tree nodes” in NVivo. These tree nodes were built based on the literal and figurative meaning that the researcher drew on from the understanding of the information contained in the interviews. Then, the tree nodes contained branches as in:

- Teacher’s role/values/mediator

NVivo enabled the researcher to store quotes at each free and tree node allowing the researcher to check any coded piece of text with its original context. This program also allows counting the number of times a word is repeated in the text which allows identifying which category was a strong theme in the data. It is also possible to show the connection between the references and the original interview, making it much easier to trace back which interview the references came from. The excerpts quoted in this document are referenced with interview and/or focus group line numbers in the transcripts. So, for example, FG1 5/10 means that the quotation is from focus group 1, line 5 to 10. Interviews and focus groups were held on dates that were pre-arranged with the students and teachers.

From the interview and focus groups analysis, responses to the interview questions showed that participants in both types of environments highly valued the presence of the teacher. In the face-to-face group, the teacher was considered as a valuable guide, as illustrated in this excerpt

I mean in this case, Miss V she has been very supportive with the class, and I like that structure of the class. In terms of...eh...she arrives in the class, she asks, what we did, what are we going to do. And she asks every person of the group what you learnt last class, and you share with your partners. And then, at the end it's what you have found and what we are going to do the next week or the next class. (FG2 39/43)

The teacher was considered as the provider of constant guidance instead of being the one telling the students what to do. She always encouraged the use of appropriate social skills as expressed by case study number one from the face-to-face group

She said to us, "No, that's not the information that you have to look for". And she gave us the instructions, she said "be respectful", "be tolerant" and help with your classmates, she helped us in that way to do our job better, of course. (I3 12/14)

It is important to notice that not only was the teacher scaffolding students' knowledge by giving them the appropriate instructions, but also promoting the use of social skills that were needed when working cooperatively (Gillies, 2007). This allowed students to change their perception of what cooperative learning was, as stated by case study student number 2:

At the beginning I didn't know how to work like this, like, searching and then sharing, I had no idea how to do that. (I3 10/12)

However this change was prompted by the teacher's guidance as also expressed by this participant:

I like having this like these set of rules or set goals that we have to achieve because then it was like... the work was more meaningful. (I3 21/23)

And the participant went on to say:

I think that mainly those goals, that we set up with my classmates, were the guidelines that the teacher gave us, so I think that was very crucial...the guidelines having a ...something to achieve

In the case of those participants in the virtual group, the role they assigned to the teacher was also that of guidance when interacting in-world, as stated by case study student number 1

In this case, the teacher, the person that is mainly eh...encouraging us to build our own learning (I2 25/26).

The information provided by the participant helped clarify the role the teacher had in promoting their knowledge construction based on their interactions. This aligned with the social constructivist views held by Vygotsky (1978) and the learning that occurs within the zone of proximal development (Vygotsky, 1978). This behaviour was also closely related to the second stage in Salmon's (2011) model: "online socialization". This was reinforced by the participant:

I think that the connection that she is doing and how she encourages us and how she asks for information, and the ways that she makes us participate in the project, have been a very good task, quite entertaining, and also...is like a role model, like I want to be almost like that person when I'm going to teach to my students because is not just being there typing, she also gave us the confidence to speak. (I2 35/39)

This participant also made it explicit that the teacher is perceived not only as a social promoter, but also as a role model. The teacher's presence boosted participants' confidence to voice their opinions and ideas. In addition to that, participants in the virtual environment reaffirmed the idea that having a teacher is an essential element for learning as indicated by a student in a focus group:

But I think that for all the groups of work it is essential to have a teacher or someone that takes the control of the group because if we are group, all of us has different roles and we need someone who can give us orders to follow to accomplish a certain goal (FG3 25/28)

It was somewhat contradictory to notice that even though participants recognised that the virtual platform enhanced their autonomy they also acknowledged the need of the teacher as maintained in these excerpts

In the case of autonomy, it creates the sense of acting for yourself and by yourself, for the rest; because you are not just doing it for you, you are fostered your autonomy, but also you are...you have to be aware of the people that surround you (I3 32/35)

You will need the guidance of a teacher, because when you first start the project, you just don't know what to do (I3 2/3).

Teacher guidance was necessary in both types of environments, as independently claimed by the participants. It was this social interdependence (Johnson & Johnson, 2009) established in both types of environments which accounted for the development of a structured cooperative group.

This chapter has focused on describing the procedures used to conduct this research. It includes a description of the study design and the research questions. Participants' recruitment and induction process were focused on as well. It addressed both quantitative and qualitative data collection methods. The validation process of the achievement test and the modified Cooperative Learning Questionnaire were also discussed. It also covered how qualitative data were obtained. The chapter concludes with a description of the way in which both types of data were analysed.

The next chapter includes both case studies that were written based on the data collected by the different means described above. The cases of Mr J, Mr R and their respective teachers illustrate and explain the different processes that they went through to incorporate cooperative learning both for learning and teaching in the face-to-face and virtual environment.

5. The cases of Mr J and Mr R

This chapter includes both case studies which were written based on the data collected by the different means described previously. The cases of Mr J, Mr R and their respective teachers are described; the cases describe these two participants' perceptions of cooperative group work when learning about Australia in the VW of Second Life and face-to-face. It also includes quantitative results analyses for both the Cooperative Learning Questionnaire and the achievement test results.

5.1 The case of Mr J and Miss A in the virtual context of Second Life: First embedded case study

In this first embedded case study, the stories of Mr J and Miss A are presented. Mr J's story describes how his previous computing expertise and gaming experiences facilitated his understanding and grasp of the Second Life environment. This assisted him to learn cooperatively in this type of setting, an experience that improved his pre-service formation and cultural awareness of English-speaking nations outside the US and UK. His learning experience in this type of environment was closely tied to the Community of Inquiry Model which included the elements of social, cognitive and teaching presence (Garrison et al., 2000). These three elements are described and together with their confluence facilitated Mr J's holistic learning experience. Additionally, the different learning styles that Second Life appealed to when learning cooperatively are also explained. The case of Miss A is also included, describing how she embarked on the task of teaching in Second Life and how her guidance, through continuous feedback and scaffolding, were of vital importance. The types of scaffolding and feedback she used are explained and how these related to successful learning in the virtual environment of Second Life. The use of both participants' quotes throughout the case studies clearly reflect their thoughts, opinions and ideas about the learning process and perceptions of learning cooperatively.

5.1.1 The case of Mr J

Mr J's case study aligned well with the Community of Inquiry model type of learning experienced by this student as it describes the kinds of presence that converged in Second Life which enriched his learning experience. Social presence in the Second Life environment was evident through the sense of immersion that this participant claimed to have experienced. Mr J's case also subscribed appropriately to the five-stage model proposed by Salmon (2011) which includes the stages of access and motivation; online

socialisation; information exchange; knowledge construction; and development (Salmon, 2011). Mr J's case was intertwined with and overlapped that of the Col in different aspects.

Mr J is a 26 year old, 4th year pre-service teacher in the English program from where the sample was obtained. He is the youngest in a family of four. He has had a difficult life as he asserted in the following excerpt:

I come from a humble family which has been built on hard work and a hard life. In my childhood life was not easy as we faced economic problems during a long period of time, but this was not a reason for my parents to give up and as I was too young that I never realised those problems, for me it was normal not to eat at least one or two days in a week, but my parents did everything to kept us, me and my brother, without noticing it. They did a great work because I can hardly remember those days. (I1/ 2-8)

In his interviews, Mr J declared that there was a heightened sense of “being there” from the very outset of his participation in Second Life. This was possibly thanks to the *sensory immersion* (Dede, Salzman, Loftin, & Ash, 2000) capability that Second Life has of digitally reproducing the experience of being present in a three-dimensional space, hence allowing him to vividly participate in the social presence aspect of the Col model. Additionally, it is not surprising that this student underwent an increased sense of real participation when learning in the Second Life environment as the etymology of the word “avatar” itself means “a personification of one’s character” (McKerlich et al., 2011, p. 333).

Mr J had had some experience with virtual gaming environments such as “World of Warcraft” and first person shooters prior to participating in the data collection project. However, Second Life is different from VWs that have a purely amusement essence in the sense that at its core there are no goals to be achieved, or stages to pass, even though similar activities may be included with learning purposes (Wilks & Jacka, 2013). He defined himself as kind of a computer geek who likes to spend his time online surfing the net, chatting, watching videos and keeping up-to-date in technology matters. In spite of this, he acknowledged that this was the first time that he had had an educational approach through these types of environments:

In this case...I'm always trying to be in touch with virtual platforms because I'm sort of a geek person; I love to be in front of the computer and looking for new stuff and trying to learn more about something. In this case, the idea of the project is an opportunity to me because nowadays we are... well, when I finish my major and this become my career I... I'm going to use these technologies to support the learning of my students, so for me is a solid base where I can put all my energies and try to take this, and put it in a classroom and focus the learning of the students in a new way. (I2/2-8)

When he was asked of his previous experiences about working under a cooperative approach, Mr J expressed that he had never worked under such paradigm. However, he had an idea based on the term itself:

I think, for the name, cooperative, it's like a provider of information which is going to help the students to cooperate themselves, and help...and giving the help for learn by themselves (I2/45-47).

Cooperative work is uncommon in the South American context, considering that there has been wide use of a traditional approach to teaching which is giving way to a constructivist approach (Casassus, 2002). Mr J also indicated that motivation is a key element in establishing a cooperative learning environment together with tolerance, being committed to the task, and working hard. These assumptions are aligned with the basic elements of cooperation, namely, "positive interdependence, individual and group accountability, face-to-face promotive interaction, appropriate use of social skills, and group processing" (Johnson & Johnson, 2006, p. 84). When the second interview took place, four weeks after working cooperatively, Mr J was more aware of what cooperation meant. His claims, based on his four-week experience to date, relate to what Vygotsky (1978) maintained on the assumption that the construction of new knowledge is the result of social and cooperative interactions with the aim of understanding and solving problems (Vygotsky, 1978). He stated:

I think that previously I had a pretty vague knowledge about what it was working in a virtual environment, but now eh...it is all making sense to me. The way that you collaborate with the others, how you eh...prepare the students for the learning eh...now is making a new concept of what I'm learning through the project. (I2/128-132)

And he continued, saying:

Eh...for me cooperative learning involves the participation of eh...not just the teacher-students, also classmates that help to build knowledge between each other not only in the way that you make the presentation of your class. You also do your students create their own learning. That is to say, investigating how we are working eh...talking to each other, asking questions. (I2/137-141)

Mr J already had some of the skills that were needed to work and interact with other participants in Second Life and he was really interested in the opportunity to learn about Australian historical events in the virtual environment due to his lack of opportunities to travel and actually visit those places. Mr J participated in the induction process and the sixteen different sessions. These sessions were divided into two units: the Sydney Opera House and Uluru. These units were distributed throughout one academic semester. He commented:

In my case, my technical skills...I, like, used to play in other virtual platforms, so I'm aware of some key concepts or the keys that you use to move around... in this case, I'm not learning so much about the...how the virtual platform is built or function that represents eh...but I'm learning more about a place that I'd, probably, never be able to be in there so... (I2/16-21).

He also went on to say:

I grew up with a lot of games that involve participation eh...online, so I'm used to participate with people whose faces I've never seen. So, for me it's quite easy to manage this because I know how to act in this case, I know how to speak, what to do, what to say and what not to say, so, this sense of belonging is part of me. Years ago, I managed to create this sense of belonging, and I love playing video games. So, I think that, it's a part of me that no matter the place or with the person I'm working, or which is the state of a project, or just for pleasure, it will always create a sense of belonging (I2/7-14).

Prior to sessions starting on the topic of Australia, there was an induction process conducted by the teacher which included the attendance of Mr J at five sessions on the already created initiation island in Second Life called "Lionheart Pumbaa". This island allowed him to test and enhance his computer skills (such as walking, running, flying, teleporting, and moving objects) which enabled him to move freely in Second Life. This induction process overlapped with and corresponded to the first stage of Salmon's (2011) model: *access and motivation*. It is recommended that participants are trained well in advance, that the expectations and goals are made clear to them as well as cultivating an atmosphere where there is a clear need for peer learning, mutual support, and interdependence in the performance of tasks (Lee, 2009). In addition to that, the induction stage allowed him to get connected to the course, understand its purpose, and get access to course materials (Salmon, 2011). At this stage the teacher also began promoting the *appropriate use of social skills* (Johnson & Johnson, 2008a) by emphasising students respecting turns while chatting in-world. Figure 5.1 shows the initiation island "Lionheart Pumbaa."



Figure 5.1. “Lionheart Pumbaa” initiation island in Second Life.

Mr J was told that there was freedom of choice to pick the avatar he wanted from the ones available (animals, machines, vampires, humans, etc.) in Second Life; this was something that grabbed his attention and increased his enthusiasm. This is not an unusual situation as students and teachers alike have expressed considerable excitement when learning and teaching in immersive environments such as Second Life (Dawley & Dede, 2013). He ended up using a gladiator, but it all started as a joke as he commented:

....it just started as a joke, I just ...well....I was looking for someone that was pretty close to me, and that had the same look as me in the physical aspect ... so making a singular type of avatar, it gets difficult, so I just picked a guy and oh, yeah..., I wanted a gladiator, so then it is not just part of me...it's me there... (13/835-843).

5.1.2 Social presence in the Community of Inquiry model.

From a Col perspective, based on his previous experiences Mr J was able to smoothly set himself in the *social presence* aspect of the model. Creating this sense of social presence and being able to interact and connect with the other participants was something that came naturally to him. The use of avatars and the sense of immersion that users experience through them cater for the creation of this sense of presence. According to McKerlich and Anderson (2007) avatars help mediate users' interaction; it is not the avatars interacting alone, but people being digitally represented in the VW who are communicating with other users. The use of Second Life to learn about Australia, in this case, gave Mr J the opportunity to learn in a cooperative and supportive environment in which he was part of a group with a specific role to fulfil. He noted:

We divide the tasks, or the activity or what we have to look for, and then we start to search for it to make a proper result of what we are learning, and then eh...as a group we gather all the information, till we reach a conclusion of what we are trying to express (I2/42-45).

As argued by Vygotsky (1978) learning occurs at a social level first and then on the personal one. VWs must consider the social contexts within which learning takes place, just like real life settings (Palloff & Pratt, 1999). Further, environments which foster participants' interactions result in deeper student engagement and more profound learning (Palloff & Pratt, 1999). The feeling of belonging to a community as Mr J did, enhanced learning results and reduced the feeling of learner isolation which may happen in online environments. The sense of *group cohesion* (Palloff & Pratt, 1999) that Mr J experienced by learning together with peers, gave him the opportunity to extend and deepen his learning, test out new ideas by sharing them with a supportive group, and receive critical and constructive feedback. Group cohesion encouraged his collaborative acquisition of knowledge, which is fundamental for the creation of a successful online learning environment. According to Conrad and Donaldson (2004) learning activities which include the sharing of ideas and promote student interaction encourage more complex levels of cognition. Additionally, the situated learning that took place in the case of Mr J allowed him to experience learning first-hand as he discussed below:

...with the virtual environment, you remember the colours, the things that you saw there so... and the animation that the platform brings to you, makes it more enjoyable because it is not just showing you a PowerPoint, flashcards or a video, you are there! Second Life can create an unconscious learning, an indirect learning...an indirect learning so the students will probably, three or four classes later, they will remember the colours, the names, some facts about the place or, I don't know, that will...prepare them in a better way for a test or for the evaluation process than just memorising them (I2/358-367).

And he went on to say:

...Second Life makes a closeness with the different cultures because, like, I mentioned before, probably, I will never be able to go to Australia or any other place in the world, and this shows you the exact representation of how this places looks...This project is focused on Australia, but you can use any part in the world that you want to teach...you can use it in history classes, because you can bring to the students different cultural backgrounds and show them how they act, how they communicate, and also it's not just ah....there are not just flash cards...there are movements, there are... they try to make the world look so real! (I2/325-329).

As Mr J indicated, when facing a real world simulation, the learning that takes place is more meaningful and easier to remember. As a general rule, the teaching that takes place in universities or schools is usually depicted as "third-person symbolic experiences", when in fact learning is inherently based on first-person nonsymbolic events (Hai-Jew, 2010,

p. 173). As a result, VWs can assist in making the connection between information representation and experiential learning (Hai-Jew, 2010). It is the immersion sensation experienced by learners in a VE which increases the user's first-person experience type of learning due to the possibility to visualise ideas by using virtual representations (Lee et al., 2010). This is shown in Figure 5.2.



Figure 5.2. Students on a Sydney Opera House excursion.

The sixteen different lessons for the two previously mentioned units about Australia were planned under a socio-constructivist model. Dickey (2005) states that a socio-constructivist paradigm emphasises cooperative group work as it enables group members to learn from and mentor peers by accepting new roles, and assuming tasks that a single learner would be incapable of completing successfully.

In the present case, *formal cooperative* learning was used primarily since a number of instructional arrangements were made beforehand by the teacher regarding lesson objectives and group size (Johnson & Johnson, 2004). Additionally, there were also aspects of *informal cooperative* learning since students were working together to accomplish a common learning goal (Johnson & Johnson, 2004). *Cooperative base group* (Johnson & Holubec, 2002; Johnson & Johnson, 2006) learning was also included since the groups had heterogeneous stable members supporting and encouraging each other. Finally, *constructive controversy* (Johnson & Johnson, 2006; Johnson & Johnson, 2003b) was reflected in one student having ideas and opinions which were incompatible with those of another, both of them seeking to reach an agreement. In the interviews, when

asking Mr J about his impressions on the paradigm shift from a teacher to student-centred approach to teaching, he viewed that as something positive. He reflected:

I think it's good and it's what today's education wants. It centres not only in the learning process, but in the student's. I think that is good. It's a little bit tough, because we, we haven't been taught with this methodology at all....my whole life, wasn't taught with this methodology when I was in the primary school, then the secondary school, they just focused on learning and then teachers, so to change this, like this image or this process is good, because, obviously, it increases you to have the self-esteem to, to know that you can do something by yourself, that you can search for information, by yourself, not just be given, not that the information has been given to you, but you can do things by yourself, and it's good because, even though it might be difficult at the beginning, because if you are not pushed to do something in particular, then you won't do it (13/908-918).

And he went on to say:

I want to be almost like that person [the teacher] when I'm going to teach to my students because is not just being there typing, she also gave us the confidence to speak ...and no matter if you make a mistake, she will always be clear, and help (12/242-245).

And referring to Second Life he stated:

I think, that this program, this software is like a new way of interaction, is good because you can learn how to do things by yourself, and if you want to learn, it provides you the opportunity to, to, to look for the information by yourself, and to do, like, the learning process for you (13/919-921).

Working under such an approach increased Mr J's self-esteem and confidence to speak, as he mentioned. Other research studies have also positively related cooperativeness to emotional maturity, higher self-esteem, self-confidence, independence and autonomy (Johnson & Johnson, 2009). Mr J also reflected that a cooperative approach to learning about Australia was something new since throughout his whole education he was instructed under a conductivist approach: "*they just focused on learning and then teachers*".

In accordance with Dickey's (2005) claims, Second Life allowed Mr J to communicate and construct new knowledge in the company of peers due to its intrinsic affordances. Second Life's unique characteristics enabled him to establish *open communication* channels with the teacher and his peers. In agreement with Dickey, Second Life provided him with the necessary confidence and responsibility to work successfully in a cooperative environment. Further, Second Life enabled him to take on a different personality and appearance; something which may not be possible for him in a traditional face-to-face learning environment, hence lowering his inhibition (Dickey, 2005). Disinhibition in virtual environments can help augment social communication and provide new interaction

contexts for those individuals whose actions are hindered as a result of personal impairment or shyness in real settings (McKerlich & Anderson, 2007). The risk-free expression environment in which the learning took place allowed this disinhibition to prosper. Adamus, Nattland and Schlenker (2014) observed that In real life, the ways in which people act to build their individuality are bound to bodily appearance, namely: sex, race and age. However, in VWs, the construction of an individual's identity is not restricted to the physical aspect (Adamus et al., 2014). As a result of this, Filiciak (2003) has indicated that an individual can express different facets of his/her personality in diverse virtual environments with the possibility of having varied identities in different VWs. This is closely related to Mr J's experience in Second Life as he commented:

I think that the experience has been very good, it has been great. As I said, it has given me the opportunity to be like another guy, because obviously you are not the same when you are working in Second Life. It gives you more personality, and also...it's given me the opportunity to go to another country (I2/550-554).

It is remarkable to note that Mr J speaks of being "another guy" while in Second Life and how he mentioned that this kind of environment also gave him "more personality". Mr J's comment confirmed what McKerlich and Anderson (2007) suggested about VEs promoting disinhibition and increased social communication as it occurred in his case. It is also important to notice how he spoke of "going to another country" as if he had actually been there, hence making evident the sense of immersion he experienced throughout the sessions as well as the first-hand experience he had.

The sense of immersion experienced by Mr J can be related to the three presence layers proposed by Warburton (2009) which he experienced when participating in the different sessions, planned beforehand, as part of the data collection project. The *physical layer* was evident when he was participating and interacting in the weekly sessions with the other participants. The use of the region map (a map that permits participants to locate themselves in-world) as well as the visual proximity he experienced, were important factors in the development of his learning and feeling of group belonging that took place in-world. The *communication layer* was experienced synchronously by means of the Second Life chat tool. There was also the use of the occasional internal message (IM) used by Mr J to communicate with his teacher. The use of emoticons ("visual cues formed from ordinary typographical symbols that when read sideways represent feelings or emotions") (Rezabek & Cochenour, 1998, p. 371) made this possible as Mr J was able to convey and add emotional expression too. The *status layer* took place in-world when Mr J, peers, and the teacher were interacting online to accomplish the different tasks. These three layers

also permitted Mr J to progress onto the second stage of Salmon's (2011) model, namely, *online socialization*. He mastered the system for communicating with peers as well as developing his sense of identity in Second Life. The online socialization stage enabled establishing positive interdependence, which is the result of individuals working closely together so that they achieve their goals (Gillies, 2007). Positive interdependence generates better group outcomes than those that occur individually (Johnson, 1999).

Each session included a specific objective, as well as a warming up activity (brainstorming by the teacher, or eliciting previous knowledge), a set of activities planned to achieve that goal and then a round-up activity for students to feel they had accomplished the session's objective. Sessions were planned in such a way that Mr J was gradually introduced to the different topics to learn about Australia; the teacher made constant connection with Mr J's cultural context to allow an even better content acquisition. Lane and Ogan (2009) stated that "while it is impossible and perhaps undesirable to model a culture with complete accuracy, the cultural model might be deemed sufficient for learning goals if it enables the student to acquire knowledge and skills in the target culture" (p. 33).

5.1.3 Cognitive presence in the Community of Inquiry model.

The cognitive presence aspect of the Col model was experienced by Mr J in the context of learning about Australian historical events and geography. As previously defined, cognitive presence in this model is related to "the extent to which meaning can be constructed by sustained communication within a group of people" (McKerlich & Anderson, 2007, p. 36). In this opportunity, the discourse originated by Mr J was based on the chat tool available in Second Life. The use of this tool was necessary since the internet connection speed was not fast enough to support voice chat for the sessions.

As declared by Garrison (2000) the use of a written medium provides time for reflection which leads to the development of higher-order thinking and reasoning skills. So what may have seemed to be a disadvantage was turned into an advantage as Mr J stated:

I have spent a great time there [in Second Life]. It has been a great experience and you can share your ideas in the same way as a face-to-face conversation. You just have to be concentrated, if not, you lost the idea, and you... and then you have to...go back to the lines that someone wrote before and then you got lost. But if you're concentrated and then you follow the instructions, I think it's a good experience, you learn a lot and it's a good way to socialise as well (12/394-399).

Furthermore:

...sometimes the conversation goes very fast so you have to go back a little bit, but it's good that it's written so you can go back and read again and then try to re-integrate yourself in. So I think it's good to have a chat kind of conversation, so you have a support or something that you can you go back to, so, it's good (I2/407-410).

As expressed by Mr J, the written proof of the session allowed him and those, at times, rather slow paced students, to be able to catch up with what the rest of the group were talking about. Additionally, he considered the lack of visual cues as no impediment for an effective communication due to the use of emoticons which enabled the addition of emotional expression in his discourse as he discussed:

...it's kind of hard to guess what the other person is trying to express, like, for example using body language, but you, you sometimes want to express something, you use the typical kind of symbols or for example, happy faces, or sad faces... for example when I didn't get something, I wrote down, for example, a confused face...it depends on how you express what you are talking about, but I think that you can do it exactly the same it's just that, maybe, it's going to take a little bit longer to express yourself (I2/416-437).

Making use of symbols to express feelings and boost affective elements in computer-mediated written communication is common practice (Garrison et al., 2000). That said, it is important to note that the medium has a central role in sustaining or hindering communication, hence influencing the development of cognitive presence (Garrison et al., 2000). The capacity to construct meaning through sustained communication by different means facilitated Mr J's transition to the third stage of Salmon's (2011) model: *information exchange*. He exchanged ideas with peers and Miss A; he also selected, used, and processed information. The information exchange phase was supported by Miss A's constant use of procedural scaffolding (Hannafin et al., 1983) for Mr J and classmates to efficiently make use of the resources they had. Additionally, the promotive interaction (Johnson & Johnson, 1999) that Miss A constantly added to the sessions was reflected in the constructive feedback she provided as well as the access to the available resources in-world.

Cognitive presence comprehends four different categories, namely, a triggering event, exploration, integration, and resolution (Garrison et al., 2000). The *triggering event* can be a discussion that causes cognitive dissonance. In this case they were the learning challenges, tasks and activities proposed by the teacher to initiate Mr J's search for answers and information. It was this prompting on the part of the teacher which kept the conversation and discussion progressing. It is also possible for discourse to be triggered, purposively or indirectly, by any group member (Garrison et al., 2001). Mr J stated:

... she [the teacher] starts asking for specific questions and... giving us clues... she asks us for some opinions, questions... giving us like...time to answer questions, for us to discuss about a certain topic, not to give us like the total answer, but to give, like, some hints about what she is waiting for, mmm...our personal experiences about something too (I1/72-76).

After this first phase, there was the *exploration* (Garrison et al., 2001) part of the process where there was an information exchange between Mr J and the rest of the students. In this phase, participants' attention continuously changes between their own personal experiences and the social world with the aim of examining new ideas (Garrison et al., 2001). The end of the exploration phase was characterised by Mr J being selective with regards to what was relevant to the issues and topics he was dealing with. This exchange of information took a while, as he noted:

...So, I think this period [exploration] took a long time to be a solid base in getting to know your co-workers... and then, comes the part of the exchange of information; gathering and exchanging the information, it was the biggest part in the project, that took around, I don't know, like four or five sessions. It summarises the main idea of the project itself that is the use of cooperative learning to deal with different realities (I4/917-922).

The next phase, *integration*, was characterised by using the ideas and information produced during the exploratory phase to create new knowledge. Integration involved conceiving a comprehensible concept based on this new knowledge (Garrison et al., 2000). During the transition from the exploratory phase, Mr J and his classmates began to assess the applicability of ideas in terms of how well they connected and described the issue being considered: learning about Australia. Integration featured a repeated movement between reflection and discourse. Garrison, Anderson, and Archer (2001), stated that at this stage the teacher needs to play a dynamic role to supply insightful questions; diagnose idea misinterpretation; provide comments and extra information to foster ongoing cognitive development; and to model critical thinking. Mr J noted that it was necessary to use his previous knowledge about the topic to build new understandings based on his interactions with the rest of the class and the teacher's scaffolding and support. He reflected:

... you take your previous knowledge then you have something, you are not empty, and then you compare it or you relate it with the new knowledge, so that's how you learn and especially with others, because everybody is sharing ideas and sharing knowledge and information so then you mix all these new things and you acquire them (I1/158-161).

And he referred to the teacher in these words:

She [the teacher] is always asking about our development what we have learned, what we need to learn, what we have to look for... something. If we have to look for something specific or if not, I think that she...she has always given us the opportunity to talk, to express ourselves in a freeway... (I2/277-280).

Resolution was the final phase of the issue under concern. Progression to this stage required clear expectations and opportunities to apply newly created knowledge and ideas. According to Garrison, Anderson, and Archer (2001), the end of this stage may entail the transition to a new problem expecting that the students have acquired valuable new ideas and understanding. Mr J referred to this phase in the interviews in conjunction with the role of the teacher:

I think that we have had a step by step scheme or a structure, what we have to look for, at the beginning and then at the end, what is the objective of the investigation or the course. I think that for this reason we need a teacher and she is doing the work alright. I think she is very good at doing that (I2/316-319).

The four phases proposed by Garrison, Anderson, and Archer (2001), namely, triggering event, exploration, integration, and resolution, helped Mr J construct his own learning. The use of varied learning activities triggered in Mr J the search for information with other peers in the Second Life environment. There was exploration of new places in-world which led to the merging and discussion of the new information discovered by Mr J. Answering to the proposed learning activities in the company of his peers resulted in new knowledge construction for Mr J. These four phases also enabled him to move onto the fourth stage in Salmon's (2011) model: *knowledge construction*. Mr J and his classmates developed collaborative efforts for knowledge building as well as establishing common understandings. Further, the establishment of *individual accountability* (Gillies, 2007), resulting from Miss A's extrinsic requests to complete tasks, guaranteed that each participant would contribute to the group and no unnecessary efforts were made. Within any educational setting, different situations may require direct guidance if the aim is to achieve significant profound learning (Garrison & Cleveland-Innes, 2005b). Further, that at times, the conversation requires being summarised, distinct ideas need to be supplied, or a student needs to be assisted. The aim in deep learning is to ease the conversation flow from the exploration stage to integration and then to resolution (Garrison & Cleveland-Innes, 2005b).

5.1.4 Learning styles in Second Life.

Mr J defined himself as a mixed type of learner. However, working in the Second Life environment mostly appealed to his visual learning style as he mentioned several times in the interviews. Mr J referred to his learning styles in this excerpt:

... Second Life helped me create the awareness of the different learning styles I have. In my case, I think that I am kind of a visual and auditory learner; I have a strange way of learning, because I need to be hearing, seeing, and writing at the same time. Second Life does not only cater for just one part of the different learning aspects, because it involves the 3 of them. Despite you are not moving in real life, you are moving a virtual character... but I've also learned that I was able to learn something different using a different type of style, than the ones that I'm used to, because I'm a more visual student, but I learned that I could learn things in the kinaesthetic way too (14/1089-1092).

The kinaesthetic way of learning that he declared to have experienced comes from the avatar use in Second Life. It is also the result of manipulating the actual computer mouse that enabled Mr J to engage more in the activities proposed. Mr J and his classmates set off on constant excursions in-world to learn about the Sydney Opera House and Uluru. In this environment, they had to look for information, observe, “touch” the buildings and rock formations, and familiarise themselves with the environments and interact with other people. This was done with the aim of achieving the objectives for the different tasks and learning challenges the teacher presented them with. All of this navigating around accounted for an increased sense of involvement and proximity with the environment. Closely tied to this “physical” component there was the visual component. Having the chance to see the different colours, tones, appreciate the architecture of the Opera House building as well as Uluru and walk and see the different surrounding areas, definitely improved his learning experience as a whole. He commented on this in the following excerpt.

I'm more visual, and also when you are walking around, you can see the, the place, how it is, you know? How it really is. So, for example, the structure, the architecture that one country [Australia] has, or the sites, that this country has, you can see them or have, like, a picture, a real picture of what this country has, so I think, that's visual, and I'm visual, so I think that this, this virtual environment has developed this style, and I think that I have increased my learning style with this (13/841-847).

And he referred to the avatar like this:

The person of the avatar that you have, is moving, is doing what you want, what you want it to do, so I think that is the kinaesthetic style... and I think that the other [auditory], yes...obviously because you've got, you have to listen to other people, you can listen to music, so you have some stuff to use there, to be involved in this Second Life experience, so I think that these styles are developed here (13/833-836).

The Second Life environment was highly appealing to the three types of learning styles, visual, kinaesthetic, and auditory, as the possibilities it presented Mr J with were vast and varied. The absence of the voice chat option was not a drawback to his participation in the learning process. The conversation, exchange of ideas, opinions, and building of knowledge took place by using emoticons, the avatar, the IM, and the chat tool, which facilitated sustained communication. The progression through the triggering, exploration, integration, and resolution phases was eased by these means. Teacher presence was important in this process as she scaffolded Mr J's learning and helped him with the transition of these four phases. Miss A's role was an important element as Mr J acknowledged; her role was fundamental for the teaching presence component of the Col model to be present.

5.1.5 Teaching presence in the Community of Inquiry model.

According to Garrison, Anderson, and Archer (2000) there are three types of teaching presence, namely: *instructional management*, *building understanding*, and *direct instruction*. Teaching presence in Mr J's case was not restricted to a teacher per se, but to a virtual teacher who was in charge of guiding his learning development. The teacher should be accountable for spontaneously summarising the ongoing conversation; guiding the dialogue and thinking process by supplying thought-provoking questions; and validating and reinforcing newly created knowledge by using diverse feedback and evaluation methods (Garrison et al., 2000). Further, teaching presence is not restricted to only one individual, but it can be supplied by any group member within the Col model, a fact that was congruent with constructivist views of knowledge construction (Garrison et al., 2000). Mr J referred to the teacher's role in these words:

The teacher helps you with the things that you don't know, so if you don't have her, you will be...you are going to miss a key element that is the interaction with another person (11/87-89).

And he continued:

The teacher was the...some kind of leader in the project because she always encouraged us and motivated us to participate. Even the shy ones had the opportunity to express their opinions and always with the support [of the teacher] that you were never wrong...no matter what you said, you took your chance to share your opinions and in this case, the teacher was the facilitator to this process (14/942-946).

Mr J's noticing that the teacher was facilitating the process and that everyone had the chance to participate, even shy students, was an important element for him to expand his knowledge in the use of a cooperative approach to learning. Further, he also perceived

that there were no appropriate or inappropriate responses since the teacher was fostering participation. All of these actions accounted for an increased sense of knowledge construction and harmonious group participation. Additionally, the teacher played a central role assisting learning to take place within the Second Life environment as described in the following section.

5.1.5.1 The case of Miss A.

Miss A was the teacher in charge of guiding the learning process in the Second Life environment. This was the first time that Miss A taught in a virtual environment. When asked about her computing expertise she discussed it in these terms:

I think that I am able to work with computers pretty well. I work with 'Excel' and 'Word' in quite a good way, and we also have here [University] some technological tools, like eh....interactive boards and I'm always using them andI think that, maybe, if I'm not an expert, I'm willing to learn, and when you are willing to do something, things are quite easier for you (I1/178-182).

Miss A's enthusiasm in accepting this new challenge was perceived in the sixteen sessions she conducted, twice a week, where she demonstrated that she was on top of things and paying attention to participants' needs. In her interviews she defined herself as a shy person, something that was not perceived whatsoever throughout the process as she was very outgoing, lively, and friendly in her way of conducting the sessions as it was observed and commented on by the students. This showed that it was not only Mr J but also Miss A who benefited from increased social communication and new interaction contexts for those individuals whose actions are hindered as a result of personal impairment or shyness in real settings (McKerlich & Anderson, 2007). When asked if she had ever taught under a cooperative approach, she addressed the topic in these terms:

I've tried to do so, but here in Chile is quite difficult, because students are... first of all, they are not used to working in groups, right?, they are used to having a kind of education, a kind of learning atmosphere where the teacher is not a guide, it's just, is a person who is going to give them everything they need, but they don't participate that much (I1/54-58).

It was clear from her comment that it was not easy trying to establish a cooperative approach to teaching. She commented that students in the Chilean context are used to the conductivist approach with the teacher spoon-feeding the class. Classes are teacher-centred and all the information is provided by the educator. Students are passive recipients of the information supplied by the teacher. It is important to mention that Miss A had a basic sense of what a cooperative approach to learning was. That came from her training as an English teacher where most of the language activities are student-centred

and based on the use of a communicative approach (Chomsky, 1959) in order to develop their linguistic skills. Due to her basic knowledge about cooperation, Miss A had to participate in the ten session induction process on how to establish a cooperatively structured classroom environment. These meetings were held for two weeks. There was an agreement to meet for 40 minutes, every day, for a period of ten days in accordance with her administrative duties and time availability. In addition to the 40 minute session, there were another extra 30 minutes to familiarise Miss A with Salmon's (2011) five-stage model on establishing an online working setting. Salmon's model incorporates the stages of access and motivation, online socialisation, information exchange, knowledge construction, and development (Salmon, 2011). In the interviews, the topic of her role was discussed and her idea was that the teacher was mainly a motivator and guide. This fact was also perceived by Mr J when he referred to the teacher as keeping all participants motivated to participate — even those shy ones. Miss A referred to her role in the following words:

I think that motivating students first, guiding them, guiding them and monitoring that... what they are doing is correct. The moment you start believing in what you are doing, and you like what you are doing, you are going to be able to transmit that feeling to your students, because you like it, and your body language, your whole being is going to be able to get them to like what you are doing (I1/97-125).

There are three elements that denote teaching presence in the Col model. At the beginning of the whole process Miss A's role was that of *instructional management*, that is, designing and organising the sixteen different sessions in conjunction with the researcher; the first stage in the teaching presence element of the Col. In the first forty-minute session, Miss A set Mr J the objective of understanding the relationship between the Aboriginal inhabitants and the land on which the Sydney Opera House is currently situated. To accomplish this, the teacher met with Mr J and the rest of the students at "the University of Queensland Island/ UQ Religion Bazaar". From this location, she teleported them to the Australia island in Second Life and brainstormed ideas to elicit Mr J's previous knowledge about this aspect. This eliciting stage set Mr J in the mood for the coming activities. Miss A asked questions like the following to foster dialogue:

- Do you know the names of the original inhabitants of Australia?
- Can you guess what kind of building there was in the site where the Opera House is now?
- Do you know what kind of structure there was in the area where the Opera House is now?

- What was the relationship like between the aboriginal people and the first European settlers? What do you think?

The teacher constantly made the connection with Mr J's Chilean reality to contrast and increase his awareness and interest in the topic. This also allowed him and the rest of the students to feel they had a base knowledge from where to start building new knowledge. In the context of this study the teacher asked questions that helped students relate previous knowledge to the new content. She prompted students to search for more information as shown in this extract from the Second Life chat. [The use of capital letters by Miss A in the Second Life chat excerpts was intended for students to see the text straight away]:

[07:52] **Miss A:** AND THE OBJECTIVE FOR TODAY IS TO EXPAND THE KNOWLEDGE ON FLORA AND FAUNA AROUND 'ULURU' AREA.

[07:53] **Miss A:** CAN SOMEBODY TELL ME ABOUT THE TYPES OF ANIMALS WE FIND IN AUSTRALIA?

[07:53] Student 1: possums!

[07:53] Student 2: crocodiles and huge spiders

[07:54] **Miss A:** EXCELLENT GUYS... I'D LIKE YOU TO GO AROUND THE PLACE AND HAVE A LOOK AT THE ANIMALS YOU CAN SEE HERE [Referring to the island in Second Life].

[07:55] Student 3: Including the mechanical bull?

[07:55] **Miss A:** HAHAAHAHAH...REMEMBER THE FIRST TIME WE CAME HERE SOME OF YOU WENT WILD RIDING THE CAMELS...?

[07:55] Student 4: I was around and I read a sign which said that here's a fence which protect the place from wild dogs...

[07:56] **Miss A:** AND WHICH ARE THOSE WILD DOGS STUDENT 4???? WHAT DO WE CALL THEM??

[07:57] Student 3: Dingoes....yes!

[07:57] **Miss A:** WELL DONE STUDENT 3!... AS USUAL... I'D LIKE TO ESTABLISH A PARALLEL WITH OUR COUNTRY. DO WE HAVE ANY ICONIC ANIMALS HERE IN CHILE??

This dialogue excerpt from an in-world session observation showed that the topic being dealt with was about the flora and fauna surrounding Uluru. The teacher allowed the students to discuss among themselves and exchange ideas related to the site; they were able to chat to other residents to obtain some extra information. The teacher gave Mr J the freedom to move around the building, discuss and exchange information based on what he was seeing. Some activities Miss A included were related to students working in their groups looking for information; each student looked for specific information related to the

role he or she decided to play in the group; students flew around the building and chatted to other residents to improve their knowledge of the topic; and students discussed and exchanged opinions on the information they found. By the end of the sessions, Mr J and classmates always convened to wrap up and debrief the session's findings. This is how the learning process was conducted in Second Life. Mr J and the rest of the students were able to consult other online resources, such as websites. In her blog for that session, Miss A wrote:

Today's session was relaxed. Students were able to follow teacher's instructions without getting confused, that is, most of them were able to chat with the teacher without getting lost. After greeting students they were teleported to Australia [the island on Second Life], as they would be getting information from this place. Once students received instructions, they started to look around the island for the information they were asked, teacher prompted them to mingle with the other people that were around Australia. Teacher would move around the island, look for students and ask them questions to check understanding.

As noted, the session was relaxed in tenor and Mr J and the other students actively participated. Activities like these helped to increase this student's knowledge about aspects of Australia for the two topics under discussion. Miss A's role as *builder of understanding* through discourse facilitation was the second stage in the teaching presence aspect which had an influence on students' activity and learning. As indicated by Garrison, Anderson, and Archer (2000), constant teacher presence, which was characterised by brief messages confirming Mr J's group contribution, resulted in increased involvement. In a preliminary study related to computer conferencing, focus groups and interviews showed that a mediator continual presence, who exemplifies critical discourse and provides critical feedback on students' contributions, is central to promote higher-order learning results (Garrison et al., 2000). Miss A's continuous weaving and request for clarification related to new information exchanged in the Second Life chat helped students increase their understanding of the topics being dealt with.

5.1.6 Scaffolding.

It was this constant "keeping an eye on the students" and messages on part of the teacher which provided Mr J and classmates with the necessary scaffolding to gradually construct their new knowledge. The basic idea related to instructional scaffolding is that there is an intellectual gap between what learners are capable of doing on their own, and what they are currently able of doing with the assistance of a more competent peer (Hogan & Pressley, 1997). Good scaffolding is also cognitively engaging for students, as it initiates and sustains a constructive and reflective process.

It has been pointed out that the utilisation of key themes and subjects that participants want to examine is recommended to maintain and enhance students' engagement (Guzdial & Turns, 2000). Miss A made use of those features throughout the process. Every single session Mr J was presented with a different objective and topic to be discussed in which he was enthusiastically engaged. Mr J was not only enthused by the Second Life environment's characteristics, but also the kind of challenges and the way in which Miss A conducted the different sessions. Additionally, her use of *strategic scaffolding* (Hannafin et al., 1983) was of great importance too. It focused on approaches to determine and choose essential information, assess accessible materials, and associate novel knowledge to previous knowledge and background (Hannafin et al., 1983). This last aspect was really important when Miss A connected Mr J's cultural background and experience with the new knowledge he was constructing. Another specific type of scaffolding used by Miss A was *inviting student participation* (Roehler & Cantlon, 1997) where Mr J was given opportunities to join in the process that was occurring. There was a constant invitation on the part of the teacher so that he would participate, with the rest of the group, in the new places in Second Life. This type of scaffolding was gradually removed. She discussed this issue in one of her interviews:

They [the students] were invited to come to the new place ['Uluru'], and it was quite difficult for me to keep them focused on what I wanted them to, because they were kind of exploring the place and they were riding on the camels, they were like kids... like small children because it was something new, as if they were with a new toy (I2/209-212).

It is important to note the difficulty Miss A had to keep the students focused when students started exploring Uluru. The new location triggered in them curiosity and a thirst for discovering new things, making that day's session a bit more "restless" than usual. However, this was a good kind of "misbehaviour" on part of the students in Miss A's view. Figure 5.3 shows students exploring the Uluru site:



Figure 5.3. Students on an excursion exploring ‘Uluru’.

Verifying and clarifying student understandings (Roehler & Cantlon, 1997) was another type of scaffolding technique that the teacher used. In this type of scaffolding, Miss A was checking Mr J’s emerging understandings. If they were reasonable, she gave positive feedback and reinforcement in the form of praise. If they were not, she offered feedback and clarification. In addition, the presence of the *group processing* (Gillies, 2007) component of cooperation promoted participants’ reflection on their work and how their goals would be achieved. This was done by Miss A by encouraging participants’ discussion on how well their final objectives were being achieved. Miss A referred to this aspect in the following words:

That was quite important, reinforcement and motivating them and asking them constantly and giving them feedback, positive feedback...and that’s mainly, yeah that’s mainly the thing about it. Because we human beings like being motivated, I mean, if you are motivated, if you are into something you are going to finish it....also at the beginning of every class we did a review, we started the class with a review. We started commenting about what we had done the previous class and then I would give the students like very clear objectives for the class of the day and that also...that was also kind of good for them because they knew quite well what they were supposed to do that particular day (13/261-271).

The constant reinforcement and guidance provided by Miss A in the Second Life environment was important throughout the whole sessions. Scaffolding in the form of reinforcement can provide a suitable framework for the learning task to take place; it also helps create an environment where the problem can be examined by students (Dennen & Burner, 2008). Similarly, Graesser, McNamara and VanLehn (2005) created computer-based learning environments to assist metacognition and inquiry. Graesser et al. designed pedagogical agents which mentor students in metacognitive strategies and exemplify self-

explanation, showing that computers are definitely a feasible tool that supports the development of thorough levels of intellectual activity when explanatory reasoning is involved. All of the scaffolding strategies used by Miss A constituted the third indicator of teaching presence in the Col which is *direct instruction*. However, direct instruction did not mean that the teacher was working under a traditional face-to-face approach to teaching, but she was centred in focusing discussion and guiding Mr J in the topics he was dealing with. Miss A's responsibility aligned with Garrison, Anderson, and Archer's (2000) assertion that the teacher should facilitate discussion by introducing new content, thought-provoking questions, and summarising the conversation by using varied ways of feedback and assessment. The reflective component of direct instruction also aligned with the fifth and last stage in Salmon's (2011) model which is *development*. It was at this stage when Mr J realised his responsibility for his own learning after reflecting on learning and achieving his personal goals. As indicated by Salmon (2011), students realising their responsibility for their knowledge construction is the result of the constructivist approach being used. Reflection enabled him to metacognitively analyse his learning process by using the 3D VW of Second Life.

5.1.7 Feedback.

Throughout the sessions Miss A was providing constant guidance and scaffolding as well as feedback. Feedback was an important element to be considered in this learning process as it allowed her to reduce "the gap" that is the level "from where the student is now to where she needs to be" (William, 2011, p. 122). Feedback (Hattie & Timperley, 2007) helped to capture Mr J's attention and helped him to keep his interest to succeed and finish the task. It also directed his attention towards the different steps required to complete the task, providing new information related to misunderstood ideas. It was also motivational so that Mr J invested more skill and effort in the task. When Mr J was asked about the feedback provided by the teacher, he discussed it in these terms:

In my case feedback was important because if you say something, you need the approval or disapproval of what you are talking about, or what you are saying or writing. So in this case, the teacher was also giving us the directions to achieve the objectives of the task. Giving us the proper feedback at the right time, at the right opportunity and also the fact that the feedback motivated us helped us a lot in the acquisition of what we were dealing with throughout the sessions (14/950-954).

Opportune feedback helped him stay focused on task and on track. Mr J acknowledged that feedback kept him motivated and helped his learning process. Feedback was provided in different ways which accorded with those stated by Hattie (2009). These

included the utilisation of affective processes; corroboration that Mr J was right or wrong; knowledge restructuring; clarification that more information was required; and indicating different strategies to comprehend specific information (Hattie, 2009). When Miss A was asked about her views on providing feedback she reflected:

I felt quite good, because I was able to perceive social skills and attitudes in the students that I hadn't perceived when you are in the classroom. So, it was quite good because we had a very nice atmosphere in 'that classroom' [inverted commas]. Everyone was participating; we were able to make jokes, to tell jokes, and I could say that students were very respectful with me, and that it's quite good because sometimes in the classroom, in real life, you tell students a joke and then they think that it is break time (I3/120-125).

Considering that she was even able to make some jokes without causing major disruptions in the class flow was an element that she highlighted in her interview; it helped her to establish a nice atmosphere in the virtual environment. She went on to say:

I'm constantly monitoring the ones who are not participating that much. Having individual feedback with these students is quite good, I think, because sometimes I'm chatting with all of them, but at the same time I'm keeping individual chats with the ones who are having problems with their avatars, so I tell them to keep on trying until they get the idea of this learning, of this virtual learning. What I'm doing also is something which students appreciate quite a lot. I'm helping them to find what they are supposed to find, giving them advice, telling them what to do, telling them to go around the island to look for information in the web (I2/65-71).

Providing individualised feedback was encouraging for both the teacher as well as the students. Constant teacher feedback worked at four levels with three feedback questions being addressed. The first feedback question related to goals: “*where am I going?*” This question related to Miss A’s need to communicate the goals of the lesson, hence the importance of learning intentions. The key components of this first feedback question related to learning intentions, goals and targets, clarity, commitment, and challenge. The challenge component permitted Mr J and/or Miss A to establish the conditions already specified by Hattie (2007) with regards to determining additional challenging objectives since the earlier ones had been achieved, thus setting new requirements to further the learning process. The second feedback question, “*how am I going there?*” highlighted the notion of progress feedback. As declared by Hattie (2007) this feedback question is frequently expressed in regards to previous accomplishment, proposed guidelines, and achievement or deficiency in relation to a distinct task component. This was reflected in the way the teacher constantly asked Mr J to reflect on his development and the way the process was taking place. She commented:

I give everyone feedback like, for example, 'Well done!', 'Excellent', 'What do you think about this?'. I'm also asking them to discuss, by telling them if they agree with the idea that somebody else has said so in that way we are having very, very active discussions. I think in that way students are participating, because they feel that they are contributing towards the whole group learning, they feel that they are not wrong (12/78-82).

Miss A's active discussion promotion amongst students, asking if there was agreement or disagreement with what somebody had said, and contributing towards group learning, permitted Mr J to think about his learning process and how he was progressing. The third feedback question, "where to next?" helped Mr J develop more self-regulation over the learning process. Self-regulation allowed him to monitor his own learning process as the provided feedback facilitated further engagement with the task. The feedback provided assisted him in choosing the next most appropriate challenge as well as getting "deeper understanding, and more information about what is and what is not understood" (Hattie & Timperley, 2007, p. 90).

The three feedback questions worked at four levels of feedback. The first level of feedback is related to the *task and product* level. Hattie (2012) stated that it is often termed "corrective feedback" and it is mostly supplied as observations related to tasks; it is frequently limited to particular aspects, hence not generalisable. It included indicating correct or incorrect responses, needing more or different responses, and providing more or different information relevant to the task. Hattie (2012) suggested that this feedback is used as a foundation upon which self-regulation and processing could be adequately built. Feedback of this type was found in the following Second Life chat excerpt:

[07:33] **Miss A:** GOOD!!... SO DO YOU REMEMBER WHAT WE WERE DISCUSSING LAST WEEK???

[07:33] **student:** Uluru.

[07:34] **Miss A:** GOOD TITO

[07:34] **Miss A:** AND CAN SOMEBODY TELL ME WHAT WE FOUND OUT ABOUT IT????

[07:34] **student:** that it is a large sandstone rock formation in the southern part of the Northern Territory, central Australia.

[07:34] **Miss A:** EXCELLENT....

[07:34] **Miss A:** GOOD GUYS

[07:34] **Mr J:** it is also known as 'Ayers' rock

[07:35] **student:** Kata Tjuta and Uluru are the two major features of the Uluru-Kata Tjuta National Park.

[07:35] **Miss A:** WE WERE COMPARING IT TO A PLACE WE HAVE HERE IN CHILE... DO YOU REMEMBER WHAT?

Process, the second feedback level, aimed at creating the product or completing the task. This type of feedback led to providing alternative processing, helping to develop learning strategies and error detection, recognising relationships between ideas, and employing task strategies. Feedback at this level included help to provide links between ideas, recognise mistakes, learn how to benefit from mistake recognition, and provide hints about strategies or errors. This type of feedback helped Mr J not only to seek connections between ideas, but also provided strategies to explicitly learn from mistakes. The teacher made use of this feedback when addressing the students as shown:

[07:53] **Miss A:** WE DISCUSSED ABOUT 'ULURU' BEING A HUGE ROCK

[07:53] **Miss A:** A SACRED PLACE RIGHT???

[07:53] **student:** yes!

[07:53] **student:** yes

[07:53] **student:** a place where they instruct one another!

[07:53] **Mr J:** 'Uluru' is sacred to the 'Anangu', the Aboriginal people of the area

[07:54] **student:** Archaeological findings to the East and West indicate that humans settled in the area more than 10,000 years ago...

Self-regulation was the third feedback level. In alignment with Hattie and Timperley's (2007) assertion, this type of feedback enhanced Mr J's ability in self-assessment, and provided increased determination for deeper task engagement. Further, it assisted him in looking for and welcoming feedback, as well as enhancing his enthusiasm to devote energy into searching for feedback and incorporating it into his practices (Hattie & Timperley, 2007). The inclusion of further questioning on the part of the teacher provided Mr J with opportunities and awareness of the importance of deliberate practice and effort. It also helped him develop confidence to pursue the learning task. The use of this type of feedback was found in the following excerpt:

[07:44] **Miss A:** OK.... SO MR J CAN YOU TELL US WHAT WE WERE DISCUSSING LAST MONDAY?

[07:44] **Mr J:** flora and fauna!!

[07:44] **Miss A:** ANIMALS LIVING IN AUSTRALIA... RIGHT???

[07:44] **student:** how Australians felt about Uluru

[07:45] **Miss A:** YES THAT WAS ALSO SOME POINT OF DISCUSSION

[07:45] **student:** flora fauna as well

[07:45] **Miss A:** BUT I HAVE THE IMPRESSION THAT WE MAINLY TALKED ABOUT ANIMALS

[07:45] **Miss A:** EXCELLENT!

[07:45] **Mr J:** the 'Anangu', which their language was the 'Ptjatjari'

[07:45] **Miss A:** GREAT Mr J

[07:46] **Miss A:** AGAIN WE DID A CONTRAST BETWEEN CHILE AND AUSTRALIA... REMEMBER???

[07:47] **student:** yes, true!

[07:47] **Miss A:** WHAT ELSE GUYS

[07:47] **Miss A:** ?????

[07:47] **Miss A:** ANYTHING ELSE

[07:47] **Miss A:** ???

[07:48] **student:** myths and legends?

The fourth and final level of feedback is directed to the *self* and it includes the notion of praise (Hattie, 2012). Praise is frequently used to encourage and reinforce students, it is expected by them and constantly present in the classroom setting (Hattie, 2012). This type of feedback was found in the following excerpt:

[08:14] **Miss A:** YES... THAT'S RIGHT MR J

[08:14] **Miss A:** HE IS A VERY CLEVER BOY!

All the feedback provided enabled Miss A to closely follow Mr J and his peers' progress throughout the different sessions, guiding and facilitating reflection on their ongoing learning process. In her second interview, and when Miss A had just started teaching in Second Life, she mentioned that she felt both curious and scared with the challenges she was going to be faced with:

At the very beginning I felt a bit curious about it [Second Life] as well as a bit, probably, frightened, because it's something...it was something completely new for me. So it was like I was stepping on unknown ground, if you know what I mean?. But I would say that over the sixth lesson, I think ah... I have been kind of ...feeling more at ease with this experience (12/12-16).

It took Miss A some time to really feel on top of things and comfortable with the teaching situation. Mr J's process of getting used to the Second Life environment was a lot faster, as he commented previously. Miss A referred to the rest of the students in these words:

I think they [the students] are more willing to cooperate and communicate not just with me, but also among themselves which is quite good because in that way we are achieving what we are supposed to do, that is to say cooperative learning, and which was one of the main reasons for this project (12/22-25).

During the process of online socialisation, participants develop a sense of association and identity within the virtual environment (Salmon, 2011). Further, that this process happens gradually since participants generally find it difficult to discover what their place and time in

the virtual environment is (Salmon, 2011). It is the teacher's role at this stage to use her expertise to guarantee that a feeling of community is developed by those immersed in the virtual setting (Salmon, 2011). The use of procedural scaffolding (Hannafin et al., 1983) is important at this stage as it allowed Miss A to make sure that participants made use of all the available resources. This was also Miss A's perception of the process as she indicated:

At the beginning, it was quite difficult for them [the students] to do [socialise], right? You welcomed them, you motivated them to work in groups, but at the beginning, I think that it might be...it might be... it was a bit difficult for them, because we, as a culture, are not used to this type of cooperative work (13/46-48).

After approximately one month Miss A was able to perceive that a sense of online community had developed. This was noted in the types of conversation participants held in-world; the familiarity with which they treated one another; and their eagerness to participate in the sessions as they arrived punctually. She referred to this process comparing it with her previous experiences in face-to-face environments:

That's why I liked this experience so much. Because when you are in real life [face-to-face] you tell your students: 'okay, let's share the information, let's talk, let's comment about it'. You ask for that, 'ok, what do you think about this?' and they stay quiet, they don't say anything. But in this project when we got to the time of socialising online, everyone, I mean you have loads of people participating, lots of people giving their opinion, and that was, that was cool, because they were also...also asking for information and receiving their information from other people even from the inhabitants that were on the island. Most of the time they were Australian themselves, so it was quite good. And I would say that, students took advantage of that and because of that they were able to build their knowledge, and I was able to realise that they were learning stuff (13/66-76).

Second Life allowed Mr J and the rest of the students to expand their boundaries and to be able to not only interact among themselves, but also with other people not directly related to the learning situation. This enriched the whole experience and took it to a whole new level since they were not only relying on one source of information, but by talking to other residents and exploring the island of Australia participants were experiencing first-hand learning and immersion. Mr J commented:

I think, more than just being a virtual environment, you are participating in real time [synchronous]... so you create the awareness of it. On the other side of the screen there is a person that, maybe, he or she is sleepy... he or she is sleepy [because of the time difference] and is helping us to acquire more about them and also they are going to learn more about us. So I think that is meaningful in a way that...eh sometimes you don't realise what you are doing, but if you are, if you try to look deeper into the fact that there is another person in another part of the world, helping you, it creates that sense of vivid knowledge, and vivid acquisition of knowledge (14/1024-1030).

Miss A's whole perception of online teaching changed radically after all of the sessions and contents had been covered in Second Life. Her prior impression was completely different and based on her own experience studying a Masters course online.

From my own experience and I have taken here [in her Master program] like 2 different courses, online courses, and the two of them were just a waste of time and money. There was a teacher in the two of them, but it's not in the way that I have been working here. It's a completely different stuff. Teachers or tutors are there, but have to email them to ask a question, and you have to wait two, three four days for an answer, so those are not... you get the answer when you don't need the help anymore (13/214-220).

And she referred to her experience in Second Life like this:

Online education here in Chile is something that is quite different from what we have been doing lately. I think that, if we were to do what I have been doing with these students in the online sessions, things would be quite different. I think it was a great experience for me as a teacher, and for the students because even though we were not looking at each other, and were working behind the screen, I could... I had the feeling that we had a kind of complicity in the end, so it was like...it was a very nice atmosphere in the class, and it was...we had a kind of connection that I don't think I have been able to have in real or face-to-face lessons (13/9-17).

Based on her experiences it is evident that there was a clear difference between the way in which online teaching was understood by the university where Miss A was enrolled for her Master program and the way in which she conducted the sessions in Second Life. The former did not have an effective approach in the use of asynchronous means of communication. By the time tutors replied to her enquiries, the information or help was no longer needed. The latter was a more efficient way as the use of synchronous tools provided by Second Life allowed prompt and efficient teacher guidance. The fact that Miss A felt that she developed a level of complicity and connection with the students is also remarkable; it was something that she had never achieved in a face-to-face environment. This was also perceived by Mr J who commented:

oh...well...at first it was like, a relation, teacher-students, but in a sort of...authority way, but now, we just laugh with her [Miss A] and it's funny, because, it's not just like to be in a class, eh...you tell a joke to the her and she starts laughing or she starts with a joke and you...but creating, maintaining the respectful environment, obviously, I think that the relation between teacher and student is fostered, because it creates a proximity, a close proximity between them (13/701-706)

Being "behind a screen", or in front of one, while using Second Life was an important element that made participants feel more relaxed and at ease with the whole learning situation. This proved that disinhibition can, indeed, increase sociability on both parts (McKerlich & Anderson, 2007). Additionally, according to Gorham and Christophel (1990),

the use of added humour encouraged the beginning of new dialogic interactions; conveyed goodwill; and helped diminishing the social gap. By the end of the sessions, Miss A was asked about how she felt with the whole student-centred process that working cooperatively encompasses. She reflected:

I felt quite well, again, because it's like students were able to construct their own knowledge without me realising that they were doing it and they also did it without them realising that they were getting the knowledge so easily...so easily, right?. They were... it was so easy for them to get the knowledge, because as we were discussing and I was kind of also connecting everything in Australia with our own reality, Latin American reality, and they were constantly making a contrast between our reality, and their reality [Australian], so I think that also helped them quite a lot. So, it was quite good for them yeah...definitely (I3/240-247).

Miss A's comments demonstrated that the use of distributed cognition and not depending heavily on the teacher at all times made the teaching-learning event a more pleasant one for both sides. Not being what King (1993) called "the sage on the stage, but the guide on the side" (p. 30) helped her to make the sessions, and the learning process, more enjoyable. However, the use of Second Life in this particular case was not exempt from certain drawbacks of a technical nature when implemented. The main one, as mentioned, was the insufficient internet speed to support voice chat for the different sessions. Therefore, when Miss A was asked if she would use this tool as a primary method, she commented:

I don't know if I'd use it as the main one because in the first time, I would have to make sure that everything works, and you know that here in Chile when talking about computers, I mean when talking about computer terms things don't work from time to time (I3/165-168).

This has not been an isolated experience, with McKerlich (2007) stating that one of the main drawbacks in using Second Life with academic intentions are technical difficulties, namely, system requirements, and limited connectivity. In spite of this, the use of the chat tool was of great assistance as has previously been explained. Another issue not directly related to technical aspects of Second Life was that of the distractions that at some point students faced. This happened when Miss A introduced the students to the Uluru topic and the way they reacted "as children with a new toy". Miss A was able to deal with this initial situation successfully as it was a momentary thing. According to Zhang, Marksby, and Heim (2010) less committed students are likely to obtain the same results in a traditional environment as they would do in a virtual classroom. However, committed students have a more gratifying experience in virtual classrooms due to the enhanced communicative activities they are exposed to (Zhang et al., 2010). When Mr J was asked how he would

rate the whole experience of learning cooperatively about Australia in Second Life (on a scale from 1 to 10), he expressed:

Ten! because for me it's a new experience and as I mentioned it in previous interviews, it's created a sense of belonging in me so I feel important now...so, I took this opportunity and I said to myself, 'this opportunity comes once in life for you, so, you have to put all your effort trying to do the best in this' and in my case, for me, I didn't know much [about Australia] until I participated in the project. So for me it was a terrific experience, it was awesome (14/1050-1053).

In Mr J's case, Second Life enhanced his learning experience, turning traditional classroom-based instruction into experiential and authentic (Atkins & Caukill, 2009), as well as engaged learning (Dalgarno & Lee, 2010). Second Life's educational possibilities manifest themselves as varied media interaction, abundant contextual clues, cultural immersion, as well as the facilitation of collaboration and communication. Other affordances also include immersion, telepresence, and "lived experiences". In addition to these, and in alignment with what McKerlich and Anderson (2007) have claimed, the enhanced sense of engagement described by Mr J resulted in collaboration being possible and supported. Additionally, there were also the beneficial effects in the use and development of alternative identities and the possibility to explore new areas within Second Life (McKerlich & Anderson, 2007). All of this resulted in Mr J's learning about Australia in a meaningful, interactive and engaging way supported by his teacher and peers.

5.1.8 Summary.

The present case study was about Mr J, who participated and learned about Australia through the use of the virtual environment of Second Life. This environment fostered his sense of presence, facilitating his learning; making it more meaningful and engaging thanks to the sense of immersion (Dede, 2009) experienced by him. Immersion was achieved through visualisations of places, interaction with peers and other people, and through the avatar, whose use enabled him to make the most out of the whole experience. Second Life also accentuated his visual learning style together with the auditory and kinaesthetic ones.

This case study subscribed to the Col model (Garrison et al., 2000), as the three types of presence (social, cognitive and teaching) were clearly identified throughout the process, and their confluence enriched Mr J's learning experience as well. The Col model was both interwoven and overlapped with the five-stage model proposed by Salmon (2011). These stages are access and motivation; online socialisation; information exchange; knowledge

construction; and development (Salmon, 2011). The social presence component experienced through the avatar use allowed him to feel part of a supportive group, achieve group cohesion, be an active member and interact with his peers. In addition to this, receiving continuous critical and constructive feedback enhanced his learning experience. The social presence aspect was overlapped with Salmon's stages access and motivation and online socialisation; they allowed him to gain access to the system and feel part of a group.

Cognitive presence was possible thanks to meaning construction through sustained chat communication with the teacher and classmates. The use of emoticons (Rezabek & Cochenour, 1998) enriched the conversation and contributed to having an affective component in each session. Cognitive presence was intertwined with information exchange and knowledge construction (Salmon, 2011). There was selective use of information as well as making meaning of that information and then sharing that new learning with others.

Finally, teaching presence was based on the teacher's organisation, discourse facilitation and instruction. This stage was overlapped with that of development (Salmon, 2011) where metacognitive reflection on learning and achieving personal goals took place. All of the learning interaction in Second Life took place under a constructivist paradigm where there were different types of constant scaffolding on the part of the teacher, who made sure to orchestrate and organise an exchange of opinions and interaction amongst Mr J and the rest of the participants.

5.2 The case of Mr R and Miss V in the face-to-face context: Second embedded case study

The stories of Mr R and Miss V will be presented in this embedded case study. This case study describes the progressive steps experienced by Mr R as he embraced the cooperative learning approach, which enabled him to work communally with his peers. The different elements of cooperation are described and explanations are given as to how they contributed to making him feel socially accepted; as part of a supportive group with a specific role to fulfil. The element of social interaction is also addressed, in particular, how this helped Mr R to overcome his initial reluctance to work with others. Cooperative learning also appealed to different styles. Those styles are described as well as how they enhanced his learning experience. In the case of Miss V the important role she had in guiding Mr R's learning is also included. It describes how she progressed from developing

an initial understanding about cooperation, to how she managed to establish a cooperative learning environment within a classroom setting. Her role was valued and appreciated throughout the different sessions due to the discourse facilitation, feedback, and scaffolding she proactively provided to Mr R and his classmates. It also explains how her role contributed towards changing Mr R's opinion of what learning with others is about.

Learning about a new country and its historical events and geographical aspects is an overwhelming endeavour, particularly if it has to be accomplished in isolation without a supportive environment. One way to account for this is by learning about a new topic under a cooperative approach which makes this task a more enjoyable one. However, members need to work together in established supportive groups so that they understand the importance of contributing to the group; being responsible for assisting each other's learning; and completing the tasks they have been assigned (Johnson & Johnson, 2003a).

In the present case, Mr R's story was prominent due to his narrating of what the whole experience of working in the company of others was. He was not very keen on working with others due to his childhood experience of moving from town to town because of his father's work requirements. This constant moving did not facilitate him building trusting relationships with others. In spite of this, the cooperative approach to learning did not only help him to overcome his unwillingness to work with others but also helped him to feel empowered in the learning process itself, by taking responsibility for his own, as well as his classmates', learning.

Miss V, the teacher, played an important role in assisting Mr R's opening up to working cooperatively. Additionally, she enabled the establishment of a cooperative learning environment which, in turn, permitted Mr R's journey to be accomplished successfully. Even though there is paucity of cooperative practice in the Chilean context, this experience proved to be fruitful as not only the academic aspect was fulfilled, but also the personal one.

5.2.1 The case of Mr R.

Mr R is a 24 year old, 4th year pre-service teacher in an English program. He is the middle child in a family of five with an older brother and one younger sister. He was born and raised in a small city in the Southern part of Chile. This city has a multicultural background as Mr R talked about:

I still remember the city I grew up in, it was so multicultural there were people from different places of the world mostly German, Italian and Arabian people. This small Chilean city is located in the south of the country and it is called Osorno. I say this because I think that that was an important reason that later would help me make up my mind to be more open to different cultures (I1/4-8).

It was this early exposure to people from different nationalities which triggered his will to get to know people from other parts of the world since he wanted, “to be more open to different cultures”. Mr R’s father worked in the construction area and they were constantly moving to different places. It was this non-stop traveling around that caused Mr R to feel some apprehension about making new friends and feeling part of a group, as he commented below:

At some point and later in my life making relationships, doing friends and having people around me was not a good idea. It was hard for me to think of working in teams for example, or, to have a group of friends that I would hang out with. Because I knew that late on the day, or at some point, I was going to move and I knew that I was going to lose this relationship so I didn't want to be tied up to something or someone (I1/20-24).

Later on when working under a cooperative approach to learning, Mr R changed his mind about this idea and he realised the benefits of working with others and feeling part of a community. Cooperative groups are the ideal environment to supply each individual with the help, confidence, and the support they need to advance academically (Johnson, Johnson, & Smith, 1991). Moreover, working with others in mixed ability groups, as was the case in this study, has an impact on student performance. A meta-analysis study of different grouping practices showed that mixed-ability groups increased the learning level of low-ability students; medium-ability students learned better in a same-ability environment; and high-ability students learned equally well regardless of the group in which they were included (Wilkinson & Fung, 2002). When he was asked whether he had ever learnt under a cooperative approach he made the following comment:

Well, I have heard that is a kind of method in which you expose your students to work in order to have ... like, a kind of communicative approach in which they work to promote social skills, and social learning. I mean interacting with each other, so they can create and construct their own and build their own, their own world about the knowledge or something like that (I1/12-16).

Mr R’s idea of the cooperation concept was mostly based on his training to become a teacher of English. This was observed when Mr R spoke of cooperation being “*like a kind of communicative approach*” which in a way reflected his training as a teacher. As previously mentioned in the case of Miss A, it is not uncommon that language teachers have a vague knowledge about cooperation. In the Chilean context, language teachers

training is based on the communicative approach (Chomsky, 1959) which shares general guidelines and principles as those that are present in cooperative group work. The development of communicative competence includes providing learners with varied opportunities to use the target language. Further, the learning should be experience-based and learner-centred (Finocchiaro & Brumfit, 1983). In the same vein, a communicative approach to language teaching requires learners to be discoverers, communicators, negotiators, and contributors of information and knowledge (Nunan, 1991; Richards & Rodgers, 1986). The communicative approach to language teaching enhances learning by considering students as builders of their own learning, supported and in the company of others. This supports Vygotsky's (1978) claims that cognitive development is an active social-interactive process.

The Second Life environment enabled the easy development of social presence as it was previously described in Mr J's case study. In the case of Mr R, working face-to-face did not cater for an easy social presence development at the beginning since there were some personality issues and differences in opinion which prevented his socialisation process from flowing smoothly. He referred to working in his group in these terms:

Maybe there is a lack of communication, and it's about how you feel with the other person who is next to you because I feel well with 'E', but I got an enemy from 'A' or 'F' because I do not talk to them too much (I2/117-119).

It has to be remembered that Mr R had difficulties in relating to others. These difficulties may have originated with his father's itinerant way of living which affected Mr R's way of relating to others. This may have also influenced his observation when he was asked to reflect on whether a cooperative approach to learning had certain disadvantages. He stated:

I think that when people disagree, when they disagree or when they don't get on well (I1/26).

Mr R and the rest of his classmates were told about the whole project in the initial stages to clarify what was expected from them. Clear expectations of acceptable behaviour were discussed, as well as task-focused and interpersonal behaviours. In spite of his consternation, Mr R actively and enthusiastically engaged in learning about Australia throughout the sixteen different sessions.

5.2.2 Elements of cooperation in the face-to-face group.

The use of a cooperative approach gave Mr R the chance to learn in a supportive environment where he had a role to fulfil. He believed that *"taking specific roles was a*

suitable thing to do to establish a connection with the rest of his group". This was aligned with one of the key elements of a structured cooperative group, namely, positive interdependence. Positive interdependence occurs when group individuals are so tightly connected that an individual's success is linked to that of the whole group (Gillies, 2007). As explained in Mr J's case, positive interdependence has the potential to generate higher achievement outcomes than those engendered by individual effort (Johnson, 1999). Additionally, it has been shown that the use of specific roles within the group promotes positive interdependence (Cohen, 1994). Moreover, positive interdependence is fostered by establishing group goals that each person must contribute to (Johnson et al., 1990).

In this case, Mr R believed that the roles within the group were best decided by the individual group members as they were *"adult learners who can decide on who is doing what, so I think that we can work on that and decide or assign who is doing what"*. There was complete freedom of choice regarding that aspect even though the teacher gave them some ideas about the different roles they could take on when working in groups. The use of roles within a cooperative environment was a way for Miss V to ensure that Mr R and students would *"interact in ways that induce[d] the cognitive processes appropriate to the learning task"* (King, 2008, p. 75). According to Ross (2008) the degree to which students' interactions are influenced and structured as a consequence of the role they have been assigned should be suitable and according to their age. Further, it has been found that highly structured environments fostered university students' communication as in the case where students were expected to recognise argumentation levels in their comments to an online group forum (Ross, 2008).

King (2008) stated that interactions can be helpful to encourage advanced intellectual development, namely, deducting, contrasting, and hypothesising. These were the types of skills that were induced in Mr R and his classmates and which allowed him to establish links between novel material and their significant previous knowledge; a requisite to be involved more deeply in sophisticated learning tasks. It has been established that learners need to: firstly, reflect on the information they already have and to then establish the link between previous knowledge and that new information (King, 2008). The use of roles also allowed for structuring and regulating that interaction (King, 2007).

In the end, Mr R's role was that of searching for information using different resources and then sharing it with his group. Roles such as group *"summariser"* assist in the expansion of

knowledge construction because it demands the combination of various concepts into a comprehensible new idea (Gillies et al., 2008). He talked about it in the following way:

My role in the group is to search for information. So, most of the time when we divide the group what I have to do is search for information. For example when the teacher gives four questions, I will be in charge of going and researching and, then, summarising and be ready to tell the other students what I found. My role is researching and then giving the information out to my other partners (I3/334-339).

According to Johnson and Johnson (1999) positive interdependence culminates in promotive interaction. Similarly, and as maintained by Johnson and Johnson, Mr R's actions involved supplying peers with competent and efficient assistance; providing materials for learning; and swapping essential resources which included the information shared with the rest of the group. Further, promotive interaction comprises group members assisting and promoting peers' efforts to successfully achieve tasks completion (Gillies & Ashman, 2003).

Summarising and explaining encouraged Mr R to reorganise and clarify new knowledge which, in turn, assisted him with the construction of more elaborated cognitive understanding than he had previously held. The use of explanations has been found to induce higher order thinking processes (Chi, Leeuw, Chiu, & LaVancher, 1994). The development of higher order thinking is the result of the widespread use of intellectual activity; this forces individuals to rearrange the content under consideration which alters individuals' previous knowledge structures (King, 2008). Further, explaining entails learners going beyond a simple description of an event; it requires learners to concentrate on the how and why of that event (King, 2008). In Mr R's case the constant use of dialogue and explanations to clarify new information with his peers resulted in new knowledge construction. Additionally, to explain something, learners need to focus on the outstanding characteristics of the issue under consideration, hence reflecting and developing a deeper understanding than they previously held (Webb, 2008). Similarly, Mr R's role within the group involved looking for information and sharing it with peers. This included focusing on those salient characteristics in the new content he had found and explaining them to his classmates, resulting in more profound knowledge.

In the study on students' development of helping behaviours in small groups conducted by Webb and Mastergeorge (2003), the researchers discovered that 76% of the participants who were given clarifications in the form of explanations were able to solve subsequent similar problems independently (Webb, 2008). The use of explanations occurs more often

among members working under structured cooperative groups rather than individuals working under unstructured cooperative group conditions (Ross, 2008). Further, studies have shown that working in small groups permits individuals to increase their knowledge, especially when learning under a cooperative approach (Johnson & Johnson, 1994). The face-to-face group shared similar characteristics as those stated by Ross as well as Johnson and Johnson (1994) in the sense that Mr R was also working in a small structured cooperative group which facilitated explanation and sharing knowledge with peers.

By being the group researcher and then sharing that information with the rest of his classmates, Mr R was also contributing to the *group processing* (Gillies, 2007) part of the cooperative cycle. This stage is essential as it allows participants to reflect and examine how successful the group is in accomplishing their objectives as well as maintaining good working relations (Gillies, 2007). Group processing ensured that all group participants were engaged in one of three social skills: (a) summarising information and group members' ideas (Mr R's role), (b) stimulating group discussions, and (c) checking to ensure that group decisions were member supported. Group processing assists in the development of good working relationships and cooperative learning skills, and the reception of constructive feedback on their contributions and participation, providing opportunities to celebrate group success (Johnson & Johnson, 2003a). Mr R then kept on talking about the different role he had to occasionally fulfil as the group leader:

Most of the time I think is great [looking for information] but there has been other times, other days in which I have had to be the leader, I needed a step to follow because sometimes my classmates are disorganised... it involves the mood to work like a leader and that influences what I'm doing (13/343-354).

It is not unusual that students experience different roles while working cooperatively. Johnson, Johnson, and Smith (1991) discussed the case of a maths class where the roles were rotated each day, as many students had never worked cooperatively, resulting in the augmentation of social skills. Additionally, when working in cooperative groups, students' duties within the group should be alternated to guarantee lower achieving students the opportunity for equal participation, which includes explanation giving (Ross, 2008). Further, in research conducted by Duran and Monereo (2005), the researchers found that role rotation increased the participation chance for those students with less capabilities while it decreased the supremacy of those who were more skilled (Ross, 2008).

5.2.3 Social interaction in the face-to-face group.

For group participants to succeed, interpersonal skills that assure prime cooperation should be promoted (Johnson & Johnson, 2008a). In the present study, the *appropriate use of social skills* (Johnson & Johnson, 2008a) was reflected in participants taking turns and respecting others' opinions. The use of these skills promoted both higher goal attainment and the construction of a better work environment for group members (Johnson & Johnson, 2008a). Cooperative group work aims to enhance students' academic achievement by supplying them with increased opportunities to learn from each other, discuss and encourage each other to excel (Slavin & Cooper, 1999). When asked about the use of social skills, Mr R expressed:

I know that there are some students who are a little bit shy, but here, as we are all doing something, everybody takes turns to learn: you, the ones who are shy, they have to speak. And I think that the ones who are more talkative, they have to wait for their turn to speak. So there is social interactions or talking...being very respectful for who is saying something or talking (I2/202-206).

Mr R also referred to the social interaction established with the teacher in the classroom environment, in relation to his role in the group, when the sessions were taking place:

I like researching to add some information [to the group] because I know that the students are going to add something else and I don't want to be the one who is not saying anything, I want to, like, add something. I like social interaction of the teacher asking if you know something and I raise my hand and I say yes! I know this, and someone is adding something or correcting me. That is very different from the other classes that I have experienced; this is more student-centred (I2/236-241).

This aspect of social interaction between the teacher and Mr R related to the *individual accountability* (Gillies, 2007) aspect of cooperation. Individual accountability requires teachers to set extrinsic demands for task completion and then check that those demands have been fulfilled (Gillies, 2007). In the present study, and aligned with Gillies's claims, individual accountability ensured that each participant contributed to the group's attempts; it prevented group participants from unnecessary efforts; and it helped the teacher to supply appropriate feedback on individual and group members' contributions (Gillies, 2007). Mr R's shared responsibility was the result of the individual accountability he experienced. Individual accountability involves individuals being accountable not only for finishing their part of the task, but also making sure that peers complete theirs (Gillies, 2007). Further, individual accountability fosters individuals' personal responsibility; hence group members are less likely to take advantage of peers' efforts (Gillies, 2007). All of the five previously mentioned aspects, positive interdependence, promotive interaction, group

processing, individual accountability, and appropriate use of social skills (Johnson, Johnson, et al., 1998a) ensured that Mr R worked communally within a structured cooperative environment. Figure 5.4 summarises the five elements of the cooperative learning model and the actions they entail.

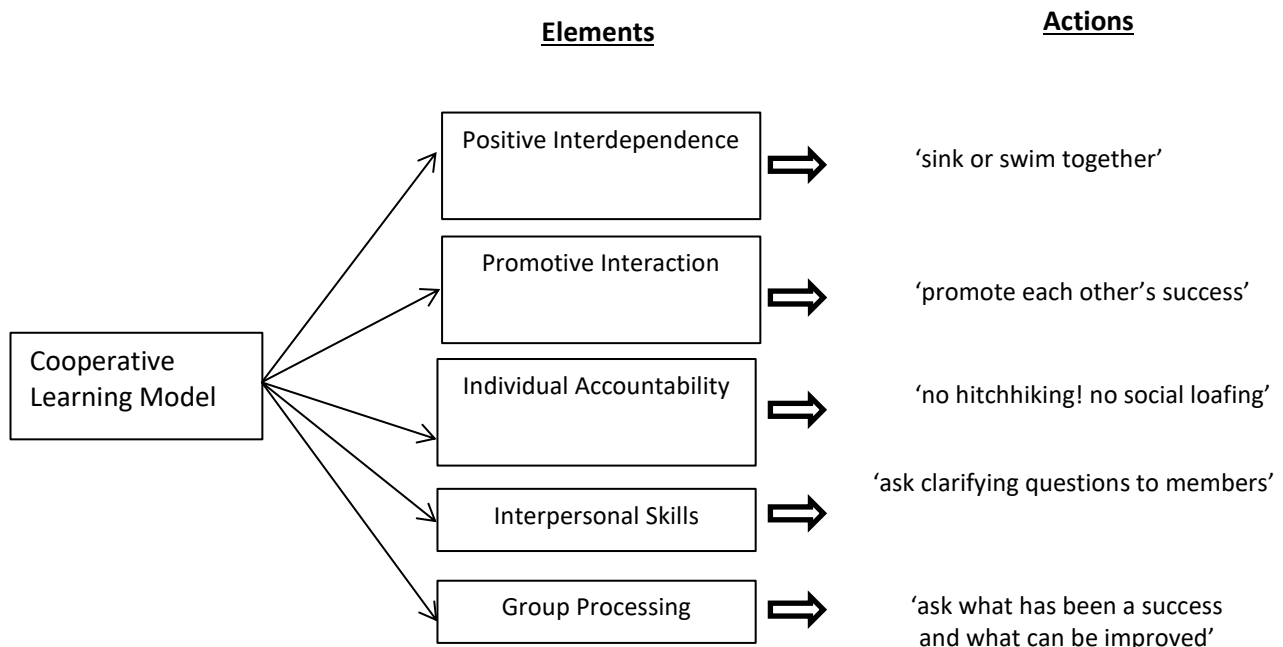


Figure 5.4. The five elements of cooperative learning (Johnson, Johnson, et al., 1998a).

Having a structured cooperative group experience allowed Mr R to interact with group peers in a way that enabled him to overcome his previously explained reticence to work with others. After some weeks of working under this approach, he commented:

I think it has been very useful in terms of learning, learning how to learn, and learn better in terms of researching and sharing with your classmates. I think that we are not used to share information and help others with information. I think it has been quite useful for me, for my learning. I think I'm going to use that in future (13/251-254).

The change of opinion about working together was an important step towards Mr R's improvement in interacting with other group members. According to Johnson and Johnson (2008a) constant individual feedback on the frequency in which participants made use of targeted social skills, enhanced participation to achieve goals and fostered better group relationships than supplying feedback to the whole group. Mr R acknowledged that he had poorer social skills prior to working in a cooperative environment.

I think at the beginning I was shy, in terms that I was doing just the work for myself and not for the group, I was working alone. Then, I got this idea of working cooperatively and then, at the end, I tried to finish and then share what I was doing. And yes, at the end it was me knowing that I had to research and share with my classmates and I also received some feedback from them and listened to the ideas they had. After that, when we finished we were like, 'Yeah what have you found?', 'Yes, I found this and that' And sharing...sharing all the time (I3/25-30).

As he stated, the cooperative approach to learning allowed him to start “opening” up to the rest of the group and working with them feeling like an integrated and active member. This was an important step for him as his previous aversion to working with others began to reduce. When he was asked to reflect on how important the development of social interaction was to help him work within his group, he noted:

My perception yeah... it has changed since the last time because at the beginning I didn't know how to work like this, like, searching and then sharing, I had no idea how to do that, and I think that my perception, now, of learning is that you can really work with the group, and if you set a goal or you have like an aim and you want something to reach, you can work quite well with your classmates. So my perception of cooperative learning now is that it is more useful and I had never heard of that [cooperative learning] before, so it's something new (I3/60-65).

His initial lack of understanding of what working cooperatively entailed reinforced what was previously explained in the case of Mr J: a constructivist approach to teaching has not started to take off in the South American context until recently (Casassus, 2002). This constructivist approach is based on a cooperative-interactive mode of learning which contrasts strongly with the traditional face-to-face classroom approach, which can be characterised as either competitive or individualistic in its nature of peer interaction and goal structure (Slavin, 1989; Slavin et al., 1985). The traditional face-to-face classroom approach has been used widely in the Chilean educational context where a cooperative approach to learning has not yet been formally implemented (García Palomer & Paredes, 2010).

Creating this network of knowledge (Mercer, 1996) to learn within his group, and the dialogue generated from it, allowed Mr R to improve his language skills. When individuals master language skills to clarify their experiences and ideas and agree on the task aim, they improve their cognitive and behavioural skills that enable them to analyse situations from a different perspective (Gillies, 2007). Mr R believed that conversation was an important element in a cooperative learning environment as he discussed below:

My perception towards cooperative learning is that [it] is very positive because you are constructing learning with all the students that are in the same classroom. Everyone can talk and add information. You have the capacity to go and talk but everything it's related to what we are saying; I think that is good for cooperative learning. I like summarising at the end; I really like that one because I feel that we have done something in the class (12/222-243).

The closing activity at the end of the class was an important element in the learning process as it gave Mr R a feeling of accomplishment. Summarising the most important aspects that were covered during the session also contributed towards the group processing stage of the cooperative learning cycle. In a later interview, Mr R was asked about his perception of cooperation based on the past weeks' experiences. He referred to it in the following way:

I like this way of learning, because I think that in this class, from the others, I feel pretty much, like, this class is me working all the time and I feel, like, I'm responsible for what I'm doing. I know that in some minute the teacher is going to come over and ask me, and I have to say something because I needed to be, like, researching all the time, which, maybe does not happen in other classes because the teacher gave you handouts and you have to complete it and that's it. But here is like you have to work, you have to construct, like, your own learning and your own materials so I think that I'm, like, pressured to do things and I like it...I like it that way (12/82-89).

Mr R, at this stage, clearly noticed the difference between his previous learning experiences and the new way of learning that he had encountered. He captured the essence of this when he noted that in the other classes “*you receive the handout, complete it and that's it*”. Cooperation let him feel responsible for what he was doing, kept him active and on track with an added hint of pressure that he enjoyed. When all of the sessions were done, Mr R reflected on how social skills helped him to work within the group:

Social skills have been important because when I searched the web I had to give that information to my classmates. I think social interaction has been a clue and I think it is positive to interact. Everyone can say something and the others are like very, very respectfully listening, and I can say that is something positive. I feel free to say whatever I want to say and the other students can make corrections or put more information in what I'm saying (13/518-522).

In his final reflections about the sessions, it is important to notice how Mr R saw the value in interacting socially, as well as highlighting the aspect of listening to each other respectfully. His expression “*feeling free to say whatever I want to say*” demonstrated he was overcoming his initial shyness. The acceptance of group member contributions was also an important advance in him becoming socially more open to the other group members. Additionally, Mr R became less overwhelmed by social interaction and this new

mind-set allowed him to mingle more freely with his peers as they worked towards a common aim.

5.2.4 Learning styles in the face-to-face group.

As mentioned in Mr J's previous case study, face-to-face cooperative work also applied to different learning styles (Fleming, 2001). In Mr R's case there were two predominant learning styles that cooperative work appealed to; visual and auditory. He commented:

I'm more visual, so I remember that I...when we were searching about 'Uluru', I had no idea what it was about. So the first thing I did it was to 'Google' it. You have a section in 'Google' which is images and I'm visual, so I was, like, 'Uluru'... so I had this general idea immediately of what it was about. At the end when we all shared the information that was more auditory. So, I think it can suit best for all the learning styles (13/160-164).

Analysis of Mr R's reflections suggest that the kinaesthetic learning style was absent. This may be attributed to this particular face-to-face learning environment not catering for a kinaesthetic approach to learning. Kinaesthetic learners prefer and require multiple types of sensorial concrete input when learning, namely, visual, auditory, smell, taste and touch (Fleming, 1995). In the previous case study, the kinaesthetic aspect was an engaging element which allowed for a hands-on experience for Mr J's learning and this resulted in an increased sense of involvement. In Mr R's case this aspect was absent as the face-to-face environment did not allow for students to interact in a more physical way. In Mr R's case the kinaesthetic aspect did not have a preponderant role although kinaesthetic learning enhances learners' engagement in miscellaneous groups of students (Diaz & Woolley, 2015).

It may seem contradictory that even though Mr R and his classmates were sitting side by side in an enclosed space, their physical proximity did not contribute to enhance their learning experience. In the previous case study, the virtual environment heightened Mr J's learning by "being there" and experiencing immersion (Dede, 2012) and new places in a more realistic way than that of conducting a website search.

The enhancement of the visual aspect that was present in Mr R's case was possible due to the use of web based resources, such as YouTube, DVDs, and online encyclopaedias. Accessing images and videos provided a more contextualised learning environment. Additionally, the possibility to exchange information and take part in discussions allowed for the auditory learning aspect to be included. It would have been desirable for kinaesthetic learning to be present as it would have provided Mr R and his classmates with a more hands-on learning experience about Australia. Nevertheless, learning

cooperatively about this topic was an enjoyable and helpful educational experience as he mentioned.

I think the experience itself to learn, how to learn in another way, was very different from what I was used to. I think it was a very good experience, too, to get to know about this cooperative learning that may be very useful for me in the future, when I'll be working as a teacher. So, I think the experience has been very helpful as a student and as a future teacher to use them in my classes (13/217-220).

The added value to this experience resided not only in the possibility for Mr R to learn about cultural aspects of Australia, but it also enlightened him to another way of learning. Mr R stated this new approach to teaching “*could be used and replicated in my future teaching practices*”.

5.2.5 The teacher role: The case of Miss V.

As in the previous case study, constant teacher guidance was of paramount importance in this learning process, as Mr R acknowledged:

I think that her role was very important because she was always telling us to speak our ideas and to say something, to share something. She was promoting this respectful environment and she created this atmosphere of working and sharing and being respectful with what the other classmates were saying. So I think that she was, like, the main [person] responsible for this, for making this atmosphere, this environment, like, cooperatively and respectful and nice to work in (13/174-180).

Miss V had a similar role to that of Miss A from the previous case study. Miss V guided the learning process by providing Mr R with constant feedback and scaffolding. She also played an important role providing guidance, encouraging discussion, and information sharing in the face-to-face environment. Miss V had never previously worked under a cooperative learning approach. When she was asked about what cooperation meant for her, she commented:

Well, I think cooperation is some sort of work in which the students should work, as the word says, cooperatively, right?, but giving each one of them a task. Usually when students are given a task they say ‘let's work in groups’ and they tend to divide the work and I think, my assumption is that, cooperative learning involves something more, meaning that students, each student should have a commitment with the work they are doing, and not divide the work but doing it together (11/18-22).

As in the previous case study, Miss V also had a basic understanding of cooperative learning which stemmed from her training as an English teacher where most of the language learning activities are student-centred and based on the use of a communicative approach (Chomsky, 1959). However, her interview assumption seemed to be contradictory as she first expressed that each student should be given a task; then, she

stated that the work should not be divided but rather, completed together. Miss V's idea was different from what cooperation actually entails. To cooperatively structure a group, the work has to be divided and there must be individual accountability where each student fulfils a specific role within the group (Johnson, 1999). When she was asked about what she believed the teacher role was, she said:

I think that first; I have to make it clear what it is about. I mean to set the rules at the beginning and tell them what the methodology is that they are going to use, and how this is going to work. Secondly, I think that the teacher should oversee what they are doing, and monitor their work giving them some feedback according to what they are doing, but the job is theirs (11/55-59).

Comparing Miss A's answer to this question, it differed to Miss V's in the sense that the former thought of the teacher mainly as a motivator and guide. The latter referred to it in terms of setting rules which shows that her teaching style was influenced by a rather conductivist approach and the teacher control it entails (Forment, 2007).

It was because of Miss V's misunderstanding about cooperation that she also had to participate in the ten-session induction process on how to correctly establish a cooperatively structured classroom environment. The meetings were held for two weeks. As with Miss A, Miss V agreed to meet with the researcher for 40 minutes each day from 17:00 to 17:40 in accordance with her time availability and administrative duties.

As in the previous case study, and aligned with Garrison, Anderson, and Archer (2000), Miss V was accountable for summarising the ongoing conversation; guiding the dialogue and thinking process; and validating and reinforcing newly created knowledge through diverse feedback and evaluation methods. Additionally, individuals working in cooperative groups would rarely engage in productive interaction in relation to the task spontaneously, unless explicitly prompted by the teacher (King, 2008). Hence, Miss V played an important role in fostering participants' learning process.

Also, and in the same vein as the type of work that took place in the virtual environment, discussion was promoted not only by the teacher but also by the group participants. This approach is consistent with constructivist views of knowledge. Miss V used the cooperative learning method of *group-investigation* (Slavin et al., 1985), throughout the different sessions, to achieve learning objectives. This method was designed to provide students with very broad and diverse learning experiences. It required the coordination of four dimensions of classroom life: organisation of the classroom into "group of groups"; the use

of multifaceted learning tasks for cooperative group investigation; and the inclusion of multilateral communication among pupils and active learning (Sharan & Sharan, 1994).

Group-investigation required students to go through six consecutive stages. In stage number one there was the *identifying of the topic and student organisation into research groups*. Miss V together with Mr R and his peers identified the topics to be dealt with which were the Sydney Opera House and Uluru. Then, Mr R joined the group of his choice as group formation by student interest is one of the principles of cooperative learning. In this case the groups were composed of 4 members each. According to Gillies (2007) this is a preferable number when compared to bigger groups because if one group contains too many members it will be less personalised and students would refrain from participating.

Stage number two was the *planning of the learning task*. Mr R and his classmates determined subtopics for the investigation. The groups decided what was to be studied and how it was to be studied. Slavin et al. (1985) claimed that tasks which are suitable for group-investigation methodology may present problems that could be dealt with in different ways.

Stage number three was titled *carrying out the investigation*. In this stage Mr R and his classmates gathered information based on their specific roles, analysed and evaluated data, and reached conclusions. Multilateral learning was stressed which included Mr R communicating with collaborators, Miss V, and other sources of information.

Stage number four was designed for the *preparation of the final report*. Mr R and his peers engaged in activities that culminated in the creation of a final script with the aim of presenting a play at the end of the process. Organising, abstracting, and synthesising information was stressed by Miss V.

Stage number five was for the *presentation of the final report* to take place. However, in this particular case the final report consisted of a role-play situation along with a task that included designing a promotional brochure about Australia. In the role-play Mr R and his peers illustrated important aspects of Uluru-Kata Tjuta National Park and the building of the Opera House in a very creative way as shown in Figures 5.5 and 5.6.



Figure 5.5. Student portrayed as an aboriginal informing tourists about Uluru-Kata Tjuta National Park.



Figure 5.6. Student portrayed as Danish architect Jørn Utzon (designer of the Opera House), being informed that his project had been awarded the prize.

The presentation involved multilateral interaction and communication. It was a moving emotional experience with participants sharing their experiences and feelings about what learning cooperatively entailed.

Finally, stage number six involved the *evaluation* process. The assessment of higher level learning was emphasised by Miss V throughout the sessions. Affective experiences (Slavin et al., 1985) that Mr R and his classmates went through were also evaluated including levels of motivation and involvement.

As stated, the group-investigation approach was used for Mr R and his companions to cooperatively learn about Australia. Sixteen different sessions were designed to cover the

two units about the Sydney Opera House and Uluru in one academic semester. Each session included a specific objective, either a warming up activity, that is, brainstorming on the part of the teacher or eliciting participants' previous knowledge, and different group activities that were planned to achieve that goal. The objective of the first forty-minute session was to understand the relationship between the Aboriginal people who inhabited the area and the site where the Sydney Opera House currently stands. Mr R and his peers formed groups and decided on the different roles to meet the objectives and achieve the best possible results. Subsequently, Miss V conducted a brainstorming activity to elicit information from Mr R on his previous knowledge about the topic. She asked questions to foster dialogue among Mr R and the group participants. For example,

- Do you know the names of the original inhabitants who populated Australia?
- Do you know what kind of structure/buildings were in the area where The Sydney Opera House currently is?
- What was the relationship between the aboriginal people and the first European settlers like? What do you think?

Brainstorming plays a pivotal role in the learning process since it activates learners' previous knowledge; without specific elicitation students will not spontaneously make use of it (King, 2008). In the first session, Mr R searched for information to understand what the settling process was like and what situations the European settlers faced. Mr R was encouraged by the teacher to dialogue, summarise, and share the information he found based on his specific role within the group. Miss V was constantly monitoring the groups, providing feedback, and overseeing the learning process. As the sessions developed, she also made comparisons and contrasts with the Chilean background to give students a baseline for learning. Miss V included activities where students had to search for specific information based on his or her role in the group; Mr R and his peers discussed and exchanged opinions on the information they had found. Once they finished, Mr R and his peers shared that information; Miss V monitored Mr R and his peers' progress and gave appropriate feedback. Mr R and his classmates were allowed to consult a variety of resources such as websites, videos, and online encyclopaedias. Some of the resources were provided by the teacher; others were sourced by Mr R and members of the group themselves.

Educators who emphasise students' active participation and the importance of learning, stress those goals that are essential for personal achievement (Gillies, 2008). Further, they use highly specific motivational language that conveys a positive attitude and expectation towards the learning process (Gillies, 2008). Additionally, in these kinds of learning contexts, students realise that positive outcomes are the result of personal efforts, and that learning is appreciated; these are indicated based on personal improvement rather than in comparison to others (Gillies, 2008).

By the end of the session all students in the groups convened together and the key learning points were summarised so that group members could demonstrate they had accomplished the session's objective. In her blog for that very first session, Miss V wrote:

The first class consisted of presenting the objectives of the class and the project itself. When they had to face the inquiries about Australia and the Sydney Opera House to activate previous knowledge, the majority did not know what to say. What was more surprising was the fact they didn't even know where to locate the area in a map. Apart from the koala and the kangaroo, they were not familiar with much more, they related Australia to the UK by looking at the flag, but they were not able to give a clear response about the European immigration or native aboriginal people. I could tell they were embarrassed about not knowing.

In this particular pre-service teacher sample, students named only two English speaking countries: England and The United States of America. Australia, generally speaking, seems to be overlooked, due to its scarce presence in the news and media coverage. The aim of the sessions was to expand Mr R and his peers' cultural horizons, hence fostering their pre-service training. When Mr R was asked his opinion about the topic of Australia and how important this was for his professional training, he addressed the question in these words:

Of course it is important, without any doubt! because you can know more about culture, about what culture is, and if you travel... you know?, I mean what place you can visit because you know about it, and it is... I mean I feel like going there. Before this research I didn't have any idea or something like that, or any thought about that country [Australia] (12/42-45).

5.2.6 Feedback.

Teacher feedback was an important element in Mr R's case. Miss V was providing constant guidance, scaffolding, and feedback. For Mr R, feedback served various purposes in lowering the gap: it provided cues that captured his attention and helped him to focus on completing the task successfully; it also directed his attention towards the processes needed to complete the learning gap reduction. Miss V's feedback clarified

ideas that had been misunderstood; it also increased Mr R's motivation with Hattie and Timperley (2007) claiming that motivated students invest more effort in the task. Mr R reflected on the feedback provided by the teacher in these terms:

I think that her feedback is important. If not, we wouldn't know what to do; in terms of feedback I think that it is necessary to have a teacher in the classroom (I3/391-392).

In Mr R's view, the feedback provided by the teacher gave him the necessary guidance and scaffolding to construct new knowledge and understand particular information. The use of feedback was encouraging for both Mr R and the teacher. Miss V was constantly providing feedback to restructure understandings and confirming that what Mr R and his classmates were doing was correct or incorrect. She commented about this in the following excerpt:

They [the students] have to think beyond that, and I have to go around the groups and give them feedback to suggest ways of going deeper into the activities, the task or the knowledge. It was encouraging. I think that they liked that part of me as a teacher being there giving them feedback, and suggesting them what to do, because sometimes you see that they are doing, let's say, fairly well, but they can do much better. Maybe, the line of thought that they are developing is not deep enough I would say, somehow, so you can, as a teacher, suggest them ways of getting where you want them to get high level thinking processes (I3/32-40).

Hattie and Timperley's (2007) theoretical model of feedback was used to analyse the flow of feedback that occurred between Mr R and Miss V. As explained before, the model operates at four levels (task, process, self-regulatory and self) with three feedback questions being addressed: Where am I going?, How am I going?, and Where to next? (Hattie & Timperley, 2007).

In the context of this study, the first feedback question. "*Where am I going?*" was related to goals. It was this first feedback question, as well as the challenge component, which allowed Miss V to promote and facilitate learning. According to Hattie and Timperley (2007) feedback enables educators to establish suitable thought-provoking objectives since the former ones are achieved, hence setting the environment to further the learning process. Her intention was to make Mr R realise different ways to obtain a result or to improve his current performance. She made this clear when she mentioned that "*you see that they are doing, let's say, fairly well, but they can do much better*".

The second feedback question, "*How am I going?*" emphasised the notion of progress. According to Hattie (2012) progress is frequently stated in relation to success or failure in a particular task section, previous accomplishment, and expected requirements. The

progress feedback was reflected in the way the teacher constantly asked Mr R to reflect on his development and the way the learning process was taking place, as she stated:

I always go around asking what they are doing, how they are doing and how they have got into an agreement, and what they are looking for, 'Have you discussed these topics?', 'What did your classmates think?'. We debate sometimes about certain topics or when they come up with something new, I tell them to share it with the class, because, I think, that is important for the whole class to learn something, and they have been very engaged in the task (I2/119-132).

The continuous questioning on part of the teacher, as well as information sharing with the class, allowed Mr R to reflect on the strategies that were required to work through each of the tasks he was presented with in each session. He referred to this process in these terms:

I've noticed that when the sessions start the teacher asks 'do you remember what we did last class?' So everybody is giving opinions and the teacher is always aware that you have something to say 'come on tell, share with the others'. At the end the teacher summarises all the contents and she makes us speak 'Can you listen to R?' he has something to share with us. So, everybody listens to me and there's this complete silence where everybody is listening (I2/185-189).

Miss V asked for more than reproduction or reconstruction of presented material by including thought-provoking questions which induced high-level cognitive processing. In order to reply to these types of questions, students have to create connections between ideas; build logic explanations; develop hypotheses; look for evidence; and draw conclusions (King, 2008). Those were exactly the types of strategies that Mr R had to make use of to answer the questions Miss V had presented him with and meet the standards for learning. Miss V constantly encouraged the use of social skills by asking group participants to silently listen to and respect each other's sharing of information and opinions.

The third feedback question, "*Where to next?*" helped Mr R to develop more self-regulation over the learning process. A self-regulatory mind-set enabled him to monitor his own learning as the feedback provided encouraged his confidence enabling him to engage further with the task. The feedback supplied by Miss V assisted him in choosing the next most appropriate challenge to increase his content knowledge and achieve a deeper understanding of the topic.

As previously explained, the three feedback questions work at four levels of feedback. These four levels correspond to phases of learning ranging from novice, through proficient, to advanced (Hattie, 2012). The first feedback level is termed "corrective feedback" and it

is mostly provided as comments on student assignments. It indicates if responses are correct or incorrect and it provides information relevant to the task (Hattie, 2012). This kind of feedback serves as a support “on which the processing and self-regulation is effectively built” (Hattie & Timperley, 2007, p. 91). A sample of this type of feedback can be found in the following excerpt from the Uluru topic:

Miss V...remember that's called “Ayers” rock by the Europeans. Why? Why did they choose that name? Does it say it there? (Referring to information found on a website).

The second feedback level, *process feedback*, was provided in the form of questions and it aimed at helping with task completion. Miss V used this type of feedback to help Mr R develop learning strategies and error detection, recognise relationships between ideas, and employ task based strategies. Feedback at this level included help to: provide connections between ideas; learn from mistakes; and identify errors (Hattie, 2012). Feedback appeared to be more effective at this level than it was at task level to enhance deeper learning. This helped Mr R not only to seek connections between ideas, but also provided strategies to explicitly learn from his mistakes. The teacher made use of this feedback when addressing students as shown below:

Miss V: *And for how long has this mountain been there? Since the beginning of time? According to the legend, it was after the big flood. How big was this?*

The third level of feedback aims at *self-regulation* (Hattie, 2012). In the same vein as declared by Hattie, this type of feedback enhanced Mr R's ability to self-evaluate his performance; assisted him in seeking and accepting feedback; and enhanced his determination to further involve himself with the task. Additionally, self-regulation enhanced Mr R's enthusiasm to devote time to look for and deal with feedback. When students are capable of controlling and self-regulating their own learning, they are able to use feedback efficiently to minimise the differences between their actual learning level and the expected results of their learning (Hattie, 2012). Miss V provided this feedback in the form of reflective or probing questions. By including further questioning, the teacher was providing opportunities and awareness of the importance of deliberate practice and effort; it also helped to develop confidence to pursue the learning. This type of feedback is illustrated in the excerpt below:

Student: *William Gosse was the discoverer of that area and he was with an Afghan guide, “Jamran”.*

Teacher: *Ah! He was with a guide. Ok.*

Student: Yes. So William gave the name to the rock

Teacher: Ok. Good! Anything else?

Student: No

Teacher: What about the relationship between the aboriginal people and those people who arrived there? Keep in mind that you could relate, somehow, how the colonisation process was here, in Latin America, and the one that happened in Australia. It wasn't the same, but there were some certain similarities, right?

The fourth and final feedback level is aimed at the “self” and it often involves the notion of “praise” (Hattie, 2012). This type of feedback is used to provide encouragement and help. It is expected and received by learners, and is habitual in classroom settings (Hattie, 2012). Feedback of this type is shown in the following excerpt:

Miss V: Well done guys, good work! Let's keep on working this way!

The feedback provided by Miss V guided Mr R and his peers' learning; it also allowed them to learn in a constructivist way by revising those aspects that needed some more in-depth attention. Duran and Monereo (2005) claim that the co-construction of knowledge is carried out by peers using the interaction created within the framework provided by the teacher. Knowledge co-construction concludes with the internalisation of it, which is useful for different problems that students have to individually solve. The different types of feedback used by the teacher constituted the continuous scaffolding necessary to make the learning task more student-centred and enjoyable.

5.2.7 Scaffolding.

As in the previous case study, Miss V used similar scaffolding techniques as those used by Miss A. Scaffolding helps individuals to establish the connection between what they are capable of doing on their own, and what they are able of doing with the help of a more experienced person (Hogan & Pressley, 1997). According to Hannafin, Land, and Oliver (1983), strategic scaffolding allows learners to evaluate accessible resources; establish the connection between novel knowledge and previous one; and recognising and choosing required information. Similarly, Miss V made use of this type of scaffolding to improve Mr R's learning process. Additionally, she also used scaffolding based on explanations. Hogan and Pressley (1997) claim that explanations are specific declarations that are adjusted to clarify learners' rising knowledge about what is being learned; how it can be used; and why and when it can be used. Miss V also made use of another scaffolding strategy known as “*inviting student participation*” (Roehler & Cantlon, 1997) since Mr R and his classmates were granted the opportunity to engage in the educational process

which was occurring. Subsequently, and aligned with what Roehler and Cantlon have maintained, Miss V supplied examples of the actions and mental processes that were required to finish the task. Mr R and his classmates had the opportunity to apply that modelled behaviour to complete their own tasks. This type of scaffolding was illustrated in the following lesson excerpt:

Miss V: *Ok, guys we are going to continue working on our project about what [prompting students]...?*

Mr R: *Australia.*

Miss V: *Australia, what in particular?*

Mr R and classmates: *Uluru*

Miss V kept on inviting Mr R and peers to actively take part in the following sessions. As established by Hogan and Pressley (1997) this kind of scaffolding is gradually eliminated. She addressed the topic in one of her interviews in the following terms:

I kept a record of what they were doing, the ways in which they participated. In my case, I would say, it's something that for me was useful. The ways in which they were or were not participating and accomplishing the objectives and if the elements of cooperative learning were present or not. I did that and if they were not doing it, I gave them some feedback...some positive feedback and reinforcement. So, they could get what I want them to get, meaning...to achieve the objective of this cooperative learning environment (13/115-120).

The record Miss V kept allowed her to follow up on Mr R's participation providing feedback and reinforcement. Miss V's use of verification and clarification of students' understandings (Roehler & Cantlon, 1997) was another type of scaffolding technique she used. By using this scaffolding technique, the teacher was constantly monitoring and verifying Mr R and his classmates' developing understandings. She used this scaffolding technique in a lesson as shown in the excerpt below:

Miss V: *...Uluru! And what is that?*

Student 1: *It is a big mountain*

Mr R: *It is a rock formation*

Miss V: *It is a rock formation*

Student 2: *It is a red mountain*

Miss V: *It is a big red mountain. What else do you know so far?...*

Miss V's use of modelling of desired behaviours (Duffy, Roehler, & Herrmann, 1988) scaffolding technique, was an addition to the previous types she employed throughout the sessions. This is a type of teaching behaviour in which Miss V showed how Mr R should

think, or act within a given situation. This modelling included *think-aloud* or showing learners the cognitive sequence that are necessary to complete a task. Think-aloud is a teaching technique in which the teacher explains orally the way she is thinking and what she is doing (Ness & Kenny, 2016). *Talk-alouds* was another modelling technique in which Miss V showed Mr R how to act by talking through the steps of the task as it was completed. Finally, *performance modelling* was another technique used by Miss V. This method shows learners how to complete a task with no use of verbalisation or think-alouds concerning the task itself or the process to complete certain task (Hogan & Pressley, 1997). This modelling was present throughout the 16 different sessions planned to cover both learning units.

Guiding Mr R's discussion was Miss V's focus throughout the sessions. This guidance occurred along the lines of what Garrison, Anderson, and Archer (2000) have established and it required Miss V leading and summarising discussion through different means of feedback and assessment; supplying topic content and questions; and assisting dialogue and reflection. Similarly, a study conducted by Hertz-Lazarowitz (1989) suggested that giving help and explanations, asking questions, exchanging, elaborations and content clarification are common elements of students' interactive behaviours which contributed to academic success. After some time working with Mr R and his classmates under a cooperative paradigm, Miss V was asked about her perception of cooperative learning. She talked about cooperation in the following terms:

I've learned a lot from the students from this face-to-face group because although I used to work similarly, there are certain patterns, certain things that you need to follow, that I wasn't aware of. Maybe I knew about them, but I didn't know the technical name for those elements, for instance, in establishing cooperative learning. It has been rewarding, I feel that they have learned, that they have matured, and that they are excited to learn new things, so it's been great (I2/189-193).

It was an important step for Miss V to have acknowledged how she also learnt from her students. As she mentioned, there were some elements of cooperation in her classes that she was not explicitly aware of. This opportunity allowed her to "put a name to her teaching practices". She also reflected on comparing a teacher-centred approach to learning under the cooperative one:

If you compare this experience with the teacher-centred approach, of course it's totally different because when a teacher believes that whatever he or she says is the truth, I don't think, the students learn much. Maybe it's the fact that in Chile it's not something that teachers like to do [cooperation] because it's not something easy for us, as well. I mean, most of the teachers that are used to conductivism have to change the whole idea. I mean the planning, the thinking the...how you present yourself to your students, the way you move, you are not going to be sitting there without doing anything. You have to be around, you have to do things. I liked it. I like to be active in the class, and I like my students to be active as well (I3/138-144).

Miss V brought up the topic of conductivism or transmission as being the preponderant teaching paradigm in the Chilean context in this interview. Her comment reinforces the idea that in the Chilean educational system there is no formal implementation of a cooperative approach to learning (García Palomer & Paredes, 2010). The paradigm shift poses a challenge to educators who are used to more traditional practices as they are faced with a new demand that is inherent to the cooperative model. Within a cooperative model, the teacher plays an active role; a role where he has to be an active person, always monitoring students' progress and going around scaffolding their knowledge, providing clarification and feedback when needed. The transformation of a learning environment from teacher to student-centred may call for a fundamental change in teachers' assumptions about their role in the classroom (Webb, 2008). Further, these changes may require a long time to become effective (Webb, 2008). In her interviews, Miss V also referred to the easiest and the most difficult elements of cooperative learning to achieve:

I think that the easiest element to accomplish was the face-to-face interaction because they were able to express themselves to solve problems, right? To discuss in a democratic way and they were able to do some scaffolding themselves. But the one that was the most difficult for them to accomplish was, I would say, positive interdependence, because you need to be, not only responsible for your own learning, but also for the group and, sometimes, they tend to be kind of selfish and they keep the knowledge just for themselves. And it was hard for them to understand that they were supposed to share it with the group and with the class, and they had problems with that (I3/75-81).

On the one hand, the *appropriate use of social skills* that took place while interacting face-to-face was the easiest element to achieve. To be able to democratically discuss their different points of view and ideas was a clear indicator of this element. The use of social skills also allowed for *group processing* to occur, which allowed Mr R and classmates to scaffold learning for themselves. On the other hand, *positive interdependence* was the most difficult element for Mr R and his classmates to achieve as they were reluctant to be responsible for their classmates' learning. As mentioned at the beginning of this case study, Mr R's way of living affected his will to interact with others, create ties and feel part

of a group. However, the use of a cooperative approach in the sessions enabled Mr R to realise how important it is to work as a team and be part of a group with all members supporting one another. He reflected:

I like working in teams now waiting for others to come up with ideas as I was not doing too many things. But in order to share, you have to find something and I find myself doing that all the time. Searching something like “Google” and working on my own makes me feel autonomous. And you had to work on our own, but you had to be cooperative. Some people may think that you don’t learn to be, like, autonomous, but I think you can learn that, because first you have to work like on your own and then share. So, I think, I have improved autonomy in that way (I3/353-358).

The cooperative approach to learning made Mr R change his mind about relating to and learning in the company of others, as he declared in his interview. Additionally, having a specific role within the group made the whole learning process easier to deal with. Whilst Mr R mentioned he “*was not doing too many things*”, this statement was not intended to be detrimental to a cooperative approach, rather, it reflected the specificity of his role as he had to look for information on his own. Subsequently there was an information sharing stage in which Mr R contributed towards his group’s learning and understanding about the topic being covered. Furthermore, he perceived his autonomy being promoted by fulfilling his specific role. This helped positive interdependence to thrive within the group. When most of the sessions were done, Mr R also referred to Miss V’s role:

I think it was good to have a teacher, and without her, I think we would have been lost. Without having the special direction of the teacher, like, where to go, so I think that without the teacher, we would have never, like, got to know as much as we did (I3/445-447).

From Mr R’s comments, it is possible to determine that the teacher played an important part in the learning process of both units about Australia. Conductivist as it may have appeared to be at the beginning, Miss V’s role gradually shifted from conducting the sessions to monitoring and overseeing the whole process.

5.2.8 Summary.

Initially, the use of a cooperative approach was a catalyst for Mr R to open up and learn and increase his basic cultural awareness of English-speaking nations outside the US and UK in an easier and more communal way. His initial reluctance to work in teams and relate to others slowly diminished after realising the benefits this approach entails. The assignment of a specific role in the group was a key step in motivating him to participate with the group. The feeling of contribution towards the group is an important element that increases interdependence and promotive interaction within the group (Cohen, 1994;

Johnson et al., 1990). The use of appropriate social skills was an element that contributed to his social development as he was able to work with the group and have his views heard. The improvement of the social atmosphere where learning takes place contributes to diminishing students' fear of ridicule which prevents them from asking for help (Ross, 2008). Further, when students have developed firm emotional bonds with peers, they are eager to help one another (Ross, 2008).

After working under a cooperative paradigm, Mr R's perception towards cooperative learning was positive as he was responsible for constructing his own learning and that of his peers. Cooperation also appealed to Mr R's visual and auditory learning styles. The inclusion of different learning styles enhanced his learning experience and he considered their use in his future teaching practices.

Miss V scaffolded Mr R's learning experience by providing opportune feedback. Her role was highly appreciated by Mr R who considered her to be a crucial component in his cooperative learning process within the context of the two units on Australia. The use of a cooperative approach for learning contributes to the establishment of students' positive camaraderie; promotes a healthy psychological environment; and fosters greater learning outcomes than individualistic learning experiences (Johnson et al., 1991). Additionally, there is evidence to suggest that when cooperation is embedded into classroom curricula, it encourages more fluid communication channels and commitment between learners and teachers (Gillies, 2008). Further, that this cooperation in turn provides students with a learning atmosphere where they experience the teacher's support and feel psychologically safe, as well as promoting cooperative research and problem-solving skills (Gillies, 2008).

In summary, cooperation proved to be a valuable method in this Chilean pre-service context which helped Mr R to feel valued and gain social acceptance when working with others. Mr R changed his views on what working with others as a team involved, after realising the benefits of cooperation. These factors combined made the learning task a more pleasant experience.

5.3 Quantitative Results Analyses

The following section describes the quantitative analysis of the Cooperative Learning Questionnaire and achievement test. The overarching Cooperative Learning Questionnaire results indicate that there was no significant difference between the virtual and the face-to-face groups' perceptions of cooperation. However, the virtual group results indicate that

they had a significantly better achievement than the face-to-face group in terms of content learning, as shown by the achievement test results. Whilst the statistical analyses indicated that there were differences between the two intervention groups at Time 1 in each of the questionnaire components, no other tests were significant. These results suggest that statistically, neither group improved significantly between Time 1 and Time 2. The instrument used to measure perception in cooperative work in both types of environments was the Cooperative Learning Questionnaire developed and validated by Gillies and Ashman (1996). For the virtual environment, the instrument was adapted and validated as explained. Cooperative Learning Questionnaire analysis considered each individual section, followed by an overall analysis.

5.3.1 Cooperative Learning Questionnaire analysis.

5.3.1.1 Part 1: Perception of the key elements for successful cooperation.

For the first part of the Cooperative Learning Questionnaire, a mixed between-within subjects analysis of variance (ANOVA) was conducted to assess the impact of the two different interventions (face-to-face and virtual) on participants' perception scores for "key elements for successful cooperation", across two time points (pre- and post-activity). There was no significant interaction between intervention type and time (i.e., the change in scores over time for the two different groups, face-to-face and virtual were not significant), Wilks Lambda = .98, $F(1, 37) = .80$, $p = .38$. Analysis showed that there was no significant main effect for time, Wilks Lambda = .98, $F(1, 37) = .80$, $p = .38$. However, the main effect comparing the two interventions was significant, $F(1, 37) = 6.5$, $p < .001$, partial eta squared = .991. This first part of the Cooperative Learning Questionnaire analysis suggested there was a significant difference between both groups for this part of the questionnaire. A follow up one way ANOVA indicated that at Time 1, there was a significant difference between participants in the face-to-face and virtual conditions, $F(1, 37) = 5.75$, $p = .022$, such that those in the face-to-face condition scored higher on their perception of the key elements of successful cooperation than those in the virtual condition. However, a follow up one way ANOVA indicated that at Time 2, there was no significant difference between participants in the face-to-face and virtual conditions $F(1, 37) = 3.34$, $p = .074$. These patterns are demonstrated in Figure 5.7, and the means and standard deviations are shown in Table 5.1.

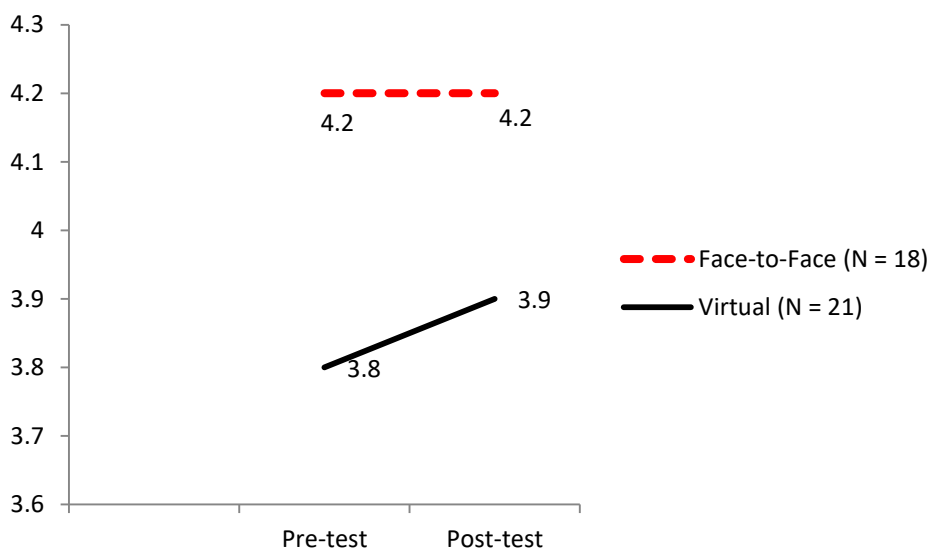


Figure 5.7. Graph showing the mean perceptions of key elements of successful cooperation for the face-to-face and virtual groups.

Table 5.1. Mean scores and standard deviations (in parentheses) for the pre-test score and post-test score for key elements of successful cooperation.

Time Period	Face-to-Face (N = 18)	Virtual (N = 21)
Pre-test	4.2 (0.44)	3.8 (0.57)
Post-test	4.2 (0.46)	3.9 (0.38)

5.3.1.2 Part 2: Perception of motivation, participation and attitude

For the second part of the Cooperative Learning Questionnaire, a mixed between-within subjects ANOVA was also conducted to assess participants' perception scores of "motivation, participation and attitude", across two time points (pre- and post-activity). There was a significant interaction between intervention type and time (i.e., there were the same changes in scores over time for the two different groups face-to-face and virtual), Wilks Lambda = .81, $F(1, 37) = 8.5, p < .006$. There was no significant main effect for time, Wilks Lambda = .99, $F(1, 37) = .45, p = .51$. The main effect comparing the two interventions was significant, $F(1, 37) = 5.1, p < 0.001$, partial eta squared = .983. These results suggested that for this questionnaire component there was a significant difference of perception of motivation, participation and attitude for both groups in their respective type of environment: face-to-face and virtual. A follow up one way ANOVA indicated that at Time 1, there was a significant difference between participants in the face-to-face and virtual conditions, $F(1, 37) = 4.46, p = .039$, such that those in the face-to-face condition

scored higher on motivation, participation and attitude than those in the virtual condition. However, a follow up one way ANOVA indicated that at Time 2, there was no significant difference between participants in the face-to-face and virtual conditions $F(1, 37) = 2.83, p = .101$. These patterns are demonstrated in Figure 5.8, and the means and standard deviations are shown in Table 5.2.

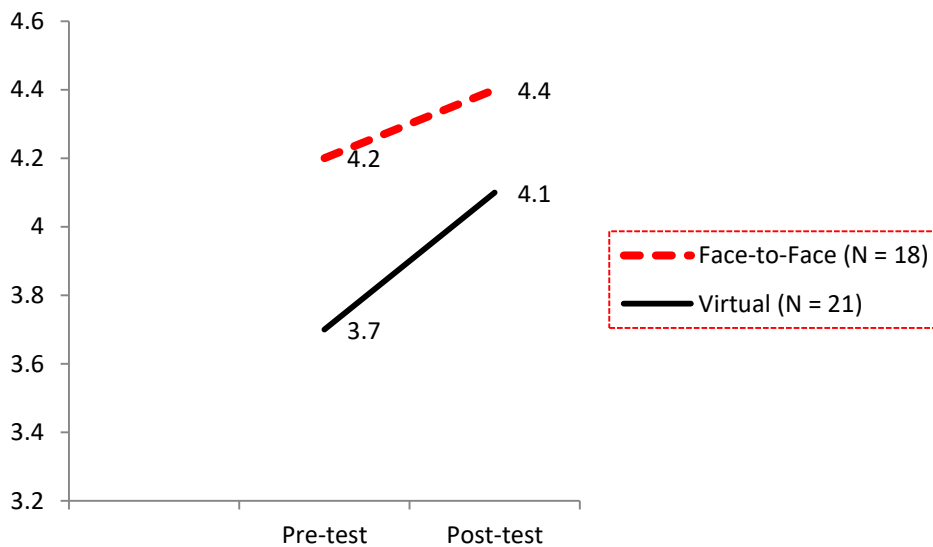


Figure 5.8. Graph showing the mean perceptions of motivation, participation and attitude for the face-to-face and virtual groups.

Table 5.2. Mean scores and standard deviations (in parentheses) for the pre-test score and post-test score for motivation, participation and attitude.

Time Period	Face-to-Face (N = 18)	Virtual (N = 21)
Pre-test	4.2 (0.56)	3.7 (0.82)
Post-test	4.4 (0.49)	4.1 (0.71)

5.3.1.3 Part 3: Perception of behaviour in the small group

For the third part, a further mixed between-within subjects ANOVA was conducted on participants' perception scores for "behaviour of the small group", across two time points (which were pre- and post-activity). There was no significant interaction between intervention type and time, Wilks Lambda = .97, $F(1, 37) = .80, p = .27$. There was no significant main effect for time, Wilks Lambda = .99, $F(1, 37) = .13, p = .73$. The main effect comparing the two interventions was significant, $F(1, 37) = 13.34, p = .000$, partial

eta squared = .99. Results suggested that there was a significant difference between the face-to-face and the virtual in their perceptions of behaviour in the small group. A follow up one way ANOVA indicated that there was a significant difference between groups at Time 1, $F(1, 37) = 7.34, p = .010$, such that participants in the face-to-face group scored higher in their perception of behaviour in small groups than those in the virtual group. A second follow-up one-way ANOVA indicated that this pattern was repeated at Time 2. There was a significant difference between groups at Time 2, $F(1, 37) = 8.81, p = .005$, such that participants in the face-to-face group scored higher than those in the virtual group. These patterns are demonstrated in Figure 5.9, and the means and standard deviations are shown in Table 5.3.

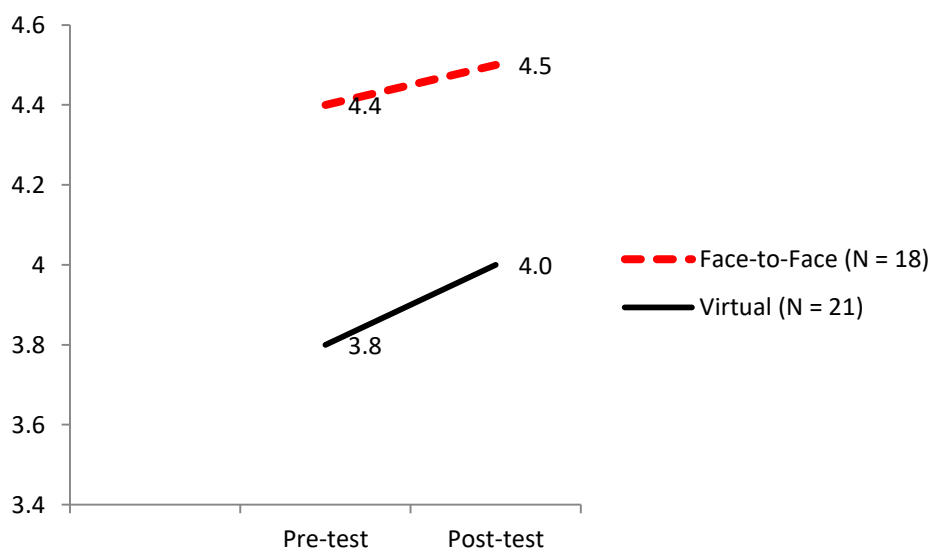


Figure 5.9. Graph showing the mean perception of behaviour of the small group for the face-to-face and virtual groups.

Table 5.3. Mean scores and standard deviations (in parentheses) for the pre-test score and post-test score for behaviour of the small group.

Time Period	Face-to-Face (N = 18)	Virtual (N = 21)
Pre-test	4.4 (0.53)	3.8 (0.71)
Post-test	4.5 (0.52)	4.0 (0.47)

5.3.1.4 Total Cooperative Learning Questionnaire perception scores.

A mixed between-within ANOVA was carried out for all items in the Cooperative Learning Questionnaire. There was no significant interaction between intervention type and time,

Wilks Lambda = .98, $F(1, 37) = .69$, $p = .41$. There was a significant main effect for time, Wilks Lambda = .89, $F(1, 37) = 4.3$, $p = .04$. The main effect comparing the two interventions was significant, $F(1, 37) = 9.7$, $p < .001$, partial eta squared = .991 suggesting that there was a significant difference between the face-to-face and the virtual group in their perceptions of cooperative group work overall. A follow up one way ANOVA indicated that there was a significant difference between groups at Time 1, $F(1, 37) = 7.39$, $p = .010$, such that participants in the face-to-face group scored higher than those in the virtual group. A second follow-up one-way ANOVA indicated that this pattern was repeated at Time 2. There was a significant difference between groups at Time 2, $F(1, 37) = 6.62$, $p = .014$, such that participants in the face-to-face group scored higher than those in the virtual group. These patterns are demonstrated in Figure 5.10, and the means and standard deviations are shown in Table 5.4.

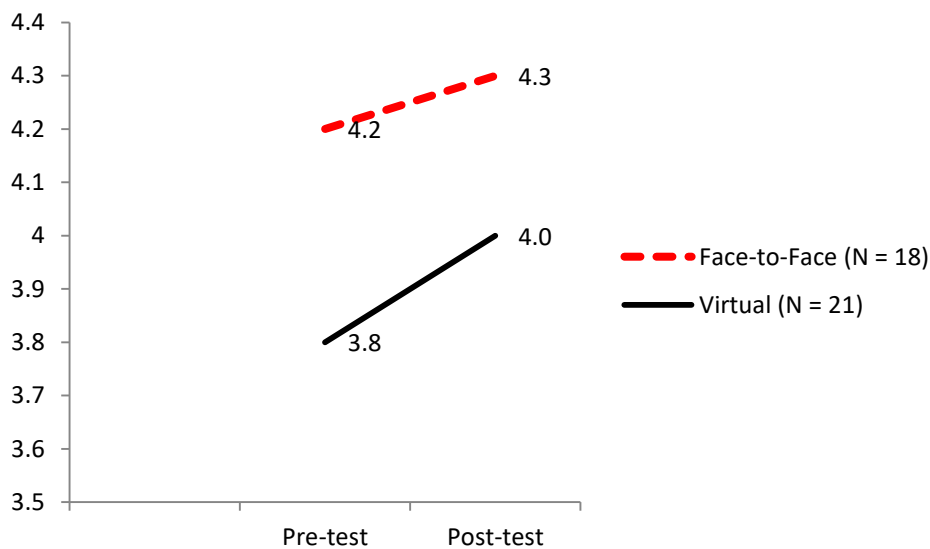


Figure 5.10. Graph showing the mean overall questionnaire outcomes for the face-to-face and virtual groups.

Table 5.4. Mean scores and standard deviations (in parentheses) for the pre-test score and post-test score for overall perceptions across the Cooperative Learning Questionnaire.

Time Period	Face-to-Face (N = 18)	Virtual (N = 21)
Pre-test	4.2 (0.38)	3.8 (0.63)
Post-test	4.3 (0.38)	4.0 (0.42)

The overarching Cooperative Learning Questionnaire analysis suggested that there was a significant difference between the face-to-face and the virtual groups in their perceptions of

cooperative group work. However, this difference appears to be derived from an initial difference in the groups at Time 1: in all questionnaire components, there was a significant difference between the two groups at Time 1, such that the face-to-face group scored higher than the virtual group on all elements of the questionnaire. For the overall Cooperative Learning Questionnaire analysis, as well as the perceptions of behaviour in small groups, there was also a significant difference at Time 2, suggesting no difference between the groups as a result of the type of intervention received. For the key elements of successful co-operation, as well as the perceptions of motivation, participation and attitude, the groups were no longer significantly different at Time 2. This result suggests that there may have been some improvement in these elements for participants in the virtual group; however if so, the improvement was not large enough to result in a significant effect of time.

5.3.2 Achievement test results.

Interestingly, another important finding of this study was that those students who learnt in Second Life had a better learning experience in the sense of content knowledge in comparison to the students learning face-to-face. The achievement test analyses showed that participants in the virtual group, compared to those in the face-to-face, significantly differed on test at Time 1. Results revealed that the virtual group ($M = 3.54$, $SD = .148$) performed significantly better than the face-to-face group ($M = 3.54$, $SD = .137$) at Time 1, $t(37) = 4.843$, $p = <.001$. As a result, in order to evaluate whether the type of learning received influenced test results, it was necessary to control for this Time 1 difference. Consequently, an Analysis of Covariance (ANCOVA) was conducted, which controlled for the Time 1 difference between groups. The results from the ANCOVA, see Table 5.5, revealed that the Virtual Groups Time 2 score ($M = 4.92$, $SD = .197$) was significantly better than the Face-to-Face Groups Time 2 score ($M = 4.124$, $SD = .217$), after controlling for the Time 1 difference, $F(1, 36) = 5.921$, $p = .02$.

This result indicates that students performed better on the test from receiving virtual learning compared to face-to-face learning. Importantly though, when examining within group differences, both face-to-face and virtual groups performed significantly better at Time 2 compared to Time 1, see Table 5.6. It was apparent that both styles of learning significantly impacted on performance, however, the virtual group performed better than the face-to-face group at Time 2.

Table 5.5. ANCOVA results for differences between the Virtual Group and Face-to-face on test score.

	Time 2	F-test	<i>p</i> value
Face to face	4.124 (.217)	5.291 (1, 36)	.02
virtual	4.917 (.197)		

Table 5.6. T-tests within the groups' performance at Time 1 and Time 2 for each learning group.

	Time 1	Time 2	Z-test	<i>p</i> value
Face to face (18)	2.56 (.452)	4.22 (.40)	-14.619	<.001
Virtual (21)	3.54 (.745)	4.84 (1.01)	-4.272	<.001

The results section of this thesis has presented the case studies of Mr J and Mr R and their respective teachers in the environments of Second Life and face-to-face. It focused on these participants' perceptions towards cooperative group work and how it helped them improve their learning about Australia. It also included quantitative results analyses of the Cooperative Learning Questionnaire and the achievement test, providing an explanation of what they mean and how they corroborate the claims of the information contained in the case studies.

6. Discussion

The present study focused on exploring Chilean pre-service English teachers' perceptions of the use of structured cooperative groups to learn about Australian historical events and geographical information in the VW of Second Life and face-to-face. This chapter addresses the face-to-face and virtual groups' perceptions of cooperative work. It also covers the research questions that informed this study based on the research gap identified in the literature review and which were answered by the qualitative data obtained from the interviews and focus groups. Additionally, and based on the results of this study, the development of a framework to assist establishing cooperative group work in virtual environments is proposed. The proposed framework stands as a helpful element towards making virtual environments even more effective when used in a learning experience. This framework will facilitate the implementation of cooperation in virtual settings such as Second Life. The framework combines Salmon's (2011) five-stage model, the elements that a structured cooperative group must comprehend (Gillies, 2007), Hannafin, Land and Oliver (1983) and Roehler and Cantlon's (1997) scaffolding components (see Figure 6.1). This framework relates to what Salmon, Nie, and Edirisingha (2010) have declared in relation to VWs: "open virtual worlds are unclaimed spaces as far as education is concerned – educators have not yet established norms of how to support learning within them" (p. 171).

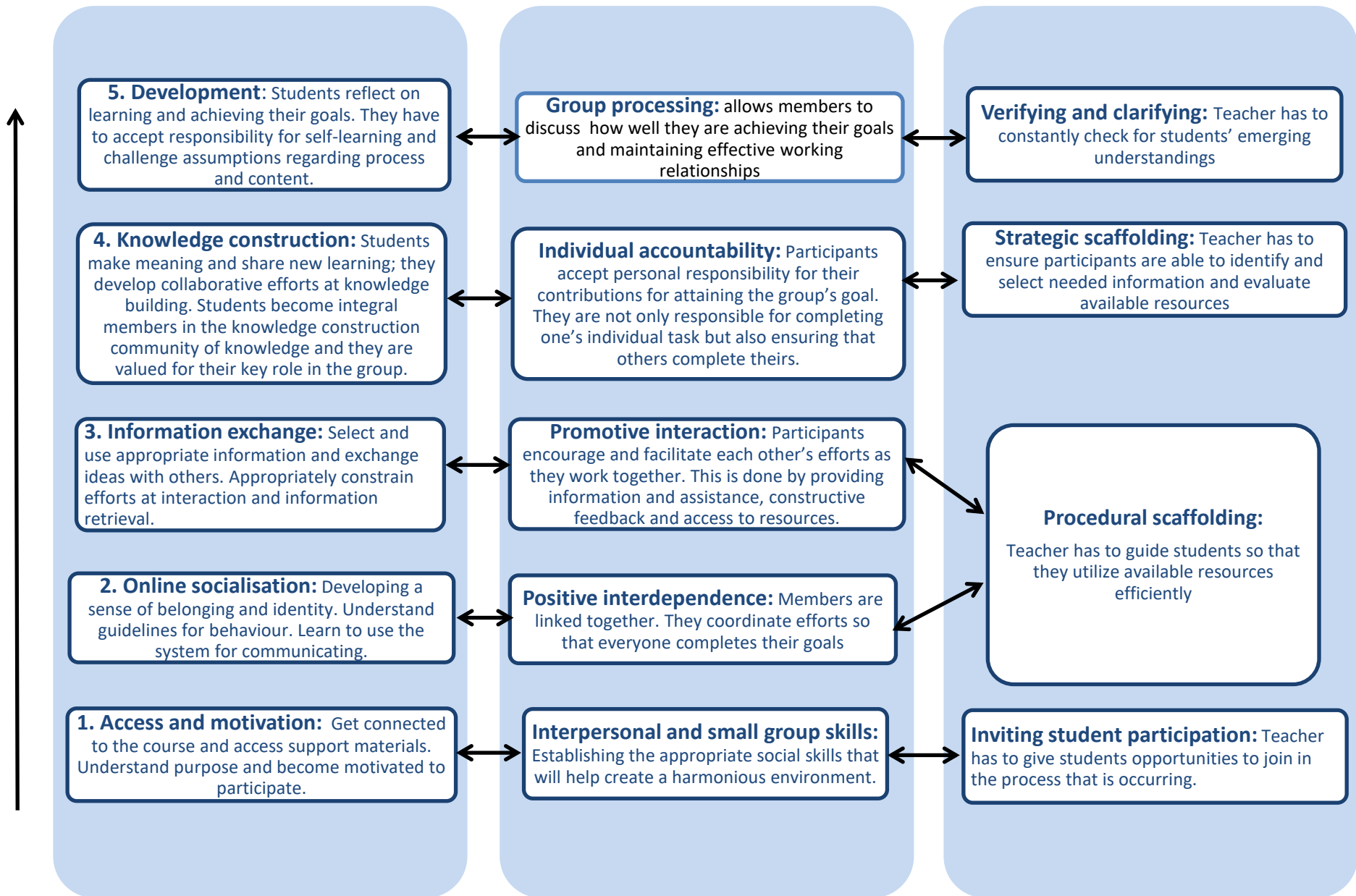


Figure 6.1. Proposed framework combining elements from Salmon's (2011) model, elements of structured cooperation (Gillies, 2007) and Hannafin, Land, and Oliver's (1983) and Roehler and Cantlon (1997) scaffolding components.

In the framework, the teacher plays a multidimensional role where he coordinates the overlapping stages and components from each model. The first stage in Salmon's (2011) model, *access and motivation*, is closely related to the *interpersonal and small group skills* element of a structured cooperative group (Gillies, 2007). Salmon's (2011) *access and motivation* stage involves participants establishing the system and getting access to it. Salmon, Nie, and Edirisingha (2010) argue that in the Second Life environment, members are required to design their avatars and learn how to control them. The researchers propose that this initial stage should be divided into two consecutive steps, namely, "learning individually, and learning in a group in-world" (Salmon et al., 2010, pp. 173-174).

Learning in a group allows for interaction with others through their avatars which is enhanced by the 3D immediacy of the Second Life environment. Salmon, Nie, and Edirisingha (2010) claimed that the realistic feel and interaction in Second Life results in co-presence being similar to the experience of socialisation that takes place in real world contexts. They expressed that the co-presence sensation experienced in this VW implies that socialisation chances are available from the minute users meet in this VW (Salmon et al., 2010). Excerpts from students who participated in this research confirm that they experienced a high level of co-presence when interacting in the VW of Second Life. Similarly, Johnson and Johnson's (1999) *interpersonal and small-group skills* elements of a structured cooperative group are analogous to what participants experience in Second Life. Based on what Johnson and Johnson have declared, when learning in groups, participants should work socially towards establishing the appropriate skills that are required to work together effectively. Gillies and Ashman (1998) claimed that the skills needed to facilitate students' interaction include understanding peers' perspectives; resolving differences; respecting turns; division of tasks; and democratic decision making. Both access and motivation and interpersonal and small group skills are at the initial stage of starting to work in the Second Life environment; it involves creating and developing the context in which learning will take place. Coupled with these two components, the teacher should make use of the *inviting student participation* (Roehler & Cantlon, 1997) scaffolding aspect in which students are constantly encouraged to become part of the learning process as it was what Miss A constantly did when conducting the sessions in Second Life.

In the second stage, *online socialisation*, the teacher should cater for the development of the sense of group belonging and identity. This involves students understanding how being online promotes learning for "*their topic, this course, this learning group*" (Salmon et al.,

2010, p. 175). According to the researchers there is a necessity to develop mutual trust and respect to work with others to solve shared tasks (Salmon et al., 2010). Additionally, Salmon, Nie, and Edirisingha (2010) claim that the Second Life environment sessions provide participants with two other ways to interact that are not available in text-based environments. The researchers indicated that the two other ways of interaction include the dialogue and interest that is enhanced by artefacts available within Second Life, and the co-presence factor resulting from greeting, meeting, and interacting with other people's avatars (Salmon et al., 2010). Research participants in the Second Life group confirmed this enhanced interaction when they expressed that they felt a strong sense of immersion while being in-world. In the same fashion, and according to what has been claimed by Alghamdi and Gillies (2013), *positive interdependence* involves individuals being connected in such a way that all of them must reach their objectives if they are to be successful. Further, that common efforts must be coordinated to ensure that everyone completes his or her specific goal (Alghamdi & Gillies, 2013). Johnson and Johnson (1990) have claimed that for cooperation to be successful, the teacher has to establish the two kinds of existing interdependence, namely, *outcomes* and *means*. At this stage, the teacher should also make use of *procedural scaffolding* (Hannafin et al., 1983) to make sure students are efficiently using all of the available resources to achieve their goals.

The third stage, *information exchange*, features a series of quick questions and answers taking place in a similar way to what happens in synchronous forums (Salmon et al., 2010). However, Salmon et al. claimed that this conversation is more contextualised due to the inclusion of the avatars' body language and Second Life artefacts resembling actual face-to-face interaction rather than a technology mediated one. It is this constant exchange of information and ideas with others which is closely associated with the *promotive interaction* component of a structured cooperative group since students support and promote each other's goals attainments (Gillies, 2007). Further, for promotive interaction to be successful, students need to provide each other with access to materials that are necessary to finish a specific task; information and help; and effective feedback to boost their performance (Gillies, 2007). She has also proposed that this is done by establishing a constant dialogue which allows students to establish new understandings about topics; reach agreements in relation to tasks; and analyse their experiences and ideas (Gillies, 2007). Similarly, group participants in both types of environments in this research felt motivated to work with and share new information and resources with their peers to construct new knowledge. The teacher has to facilitate interaction by ensuring

participants in Second Life are in constant dialogue, thus, orchestrating conversation and keeping it flowing is an important skill to be used. Additionally, the teacher's use of *procedural scaffolding* (Hannafin et al., 1983) may permit the appropriate and effective use of the features Second Life has so as to enhance information exchange and promotive interaction. In this regards, Miss A and Miss V constantly scaffolded participants while promoting constructive discussion and construction of new ideas which resulted in enhanced learning for students in both types of environments.

Salmon, Nie, and Edirisingha (2010) state that the fourth stage of *knowledge construction* in Second Life allows participants to collaboratively develop, create, and construct artefacts in-world. This enables the sharing of new learning and the establishment of common understandings and collaboration. The teacher's role at this stage is to enhance group building and the facilitation of discussion and connecting conversation and content (Salmon, 2011). *Knowledge construction* shares similarities with the *individual accountability* component of a structured cooperative group where participants are held accountable for their contributions towards attaining the group's goal. According to Gillies (2007), the teacher can foster these two stages by establishing extrinsic demands that are necessary to finish specific assignments, and then confirm that these demands have been fulfilled. Likewise, Miss A and Miss V set constant tasks and objectives to be achieved which not only guided the learning process but also constituted attainable challenges for participating students. The use of *strategic scaffolding* (Hannafin et al., 1983) by the teacher ensures that participants are able to identify and select needed information and make a proper evaluation of the available resources that the Second Life environment presents them with. Strategic scaffolding also facilitates knowledge construction and individual accountability by enabling participants to identify key information and assessing resources.

The fifth and final stage, *development*, in Salmon's (2011) model involves reflecting on learning and achieving goals. A metacognitive view of their learning through Second Life should be heightened by the teacher. Similarly, the *group processing* component of a structured cooperative group allows members to analyse their progress in relation to goal achievement (Gillies, 2007). Group processing involves participants focusing on metacognitive thinking which boosts their skills to achieve their objectives (Gillies, 2007). Additionally, group processing helps members to get an understanding of how to behave effectively to achieve those goals (Gillies, 2007). Group processing allows members to receive constructive feedback on their contribution and participation (Johnson & Johnson,

2003c). Miss A and Miss V constantly summoned students to reflect on the day's tasks and guided the dialogue to make students realise what new information they had learnt. In addition, the use of the *verifying and clarifying student understandings* (Roehler & Cantlon, 1997) scaffolding technique, on the part of the teacher, would round up the learning experience. This is an important type of scaffolding to check on emerging understandings: if they are reasonable, positive feedback can be provided; if they are not, clarification has to be used (Roehler & Cantlon, 1997). The implementation of a cooperative approach and the five-stage model in virtual environments should go in conjunction with permanent scaffolding on part of the teacher. The guiding teacher should coordinate these overlapping elements to better students' learning experience in these types of environments.

Salmon (2011) has made some modification to her traditional five-stage model to adapt it to work in Second Life. However, in her model there are no cooperative group components or the inclusion of explicit scaffolding as have been included in the model described above. The addition of these elements can assure the efficient establishment of cooperative group work in a virtual environment.

As explained in the case studies, working under a cooperative paradigm in the face-to-face and virtual environments helped Mr R and Mr J to enhance their learning experience and develop their skills for group work. The shift from teacher-centred to a student-centred approach allowed participants to be in charge of and construct their own learning. The use and implementation of a cooperative paradigm to learning was based on the sociocultural theory proposed by Vygotsky (1978) which states that human cognition and learning processes are social and culturally enacted rather than individualistically. In Mr J's case, the community of inquiry model (Garrison et al., 2000) was aligned with the type of cooperative learning that occurred in the virtual environment of Second Life. The three basic elements of this model, namely, social, cognitive and teaching presence were interrelated elements that facilitated content acquisition in the participants. Additionally, the Second Life environment contributed to Mr J's increased perception of presence and immersion due to its 3D graphical characteristics. In the case of Mr R, his work under a cooperative approach helped him to feel accepted, open up to group work, and overcome his reluctance to work with others. In both cases, this approach enabled the students to have a more hands-on learning experience.

The use of a cooperative approach enabled Mr J, Mr R, and their peers to learn in a way they had never experienced before. In the Chilean educational system there has been a preponderant use of a traditional approach that is recently giving way to a constructivist one (Casassus, 2002). Additionally, the socio-cultural issue of cultural tradition that shapes teaching practices in Chile has influenced education with the use of the *enlightened approach* and the *factory approach* (Haye & Pacheco, 1995); both models being examples of teacher-centred instructional paradigms. Taking into consideration that in the Chilean educational context teachers comply with a teacher-centred educational model, they plan their lessons around the teacher's figure (Preiss, 2009).

The use of structured cooperative groups in both types of environments permitted Mr J and Mr R to learn communally, help their peers, and feel important members within their groups. Cooperation has previously been shown to enhance students' willingness to help each other succeed with tasks, demonstrating their group cohesiveness (Johnson & Johnson, 2000) and their shared sense of community (Brown & Campione, 1994). Mr J, Mr R, and their peers reflected that learning under a cooperative approach increased their positive interdependence which has been shown to be enhanced when individuals are assigned specific roles within the group (Cohen, 1994). Further, having a specific role within the group has the effect of assigning competence to each student, which can improve self-esteem for low-status learners (Oxford, 1997).

One interesting finding in this study was related to the few differences in perceptions of cooperative work between the virtual and face-to-face group. Despite the quantitative results, as sessions progressed, qualitative data indicated that there was equivalent positive development of understandings and attitudes towards cooperative work in both groups. This implies that the type of environment was not a decisive factor which influenced both groups' perceptions towards cooperation.

The improvement in cooperative work perception that took place in the face-to-face group supported Mr R's case, where cooperation played an important role in his social development and attitude towards working and learning in the company of others. Cooperation showed him a different way to learn that contributed to reshaping his views of learning to the extent he considered using this approach in his future teaching practices. Similarly, cooperation also played an important role in Mr J and the virtual group's learning. Experiencing cooperative work in the virtual group also helped its members to develop their social skills. Cooperation implementation in Second Life was assisted by the

simultaneous inclusion of Salmon's (2011) five-stage model, Gillies' (2007) structured cooperative group components and the scaffolding elements proposed by Roehler and Cantlon (1997) and Hannafin, Land and Oliver (1983) as explained in the case studies. All these are components of the proposed framework which facilitated the establishment of cooperation in Second Life. In this particular study, the use of social skills provided everyone with a chance to contribute to the conversation; coordinate the actions of group members; reach consensus; ensure, explain, and elaborate the material being learned; keep all members on task; and maintain good working relationships among members (Johnson & Johnson, 2009). Additionally, the implementation of cooperative learning fostered productive cognitive conflicts among both groups' participants, exchanges of needed resources, mutual help and support, and verbal interactions like questions and explanations. These outcomes are aligned with views held by Neber, Finsterwald and Urban (2001) in relation to the positive outcomes of using cooperative group work.

6.1 Face-to-face group's perception of cooperative work

The results obtained from the Cooperative Learning Questionnaire, suggested that the face-to-face group experienced a positive improvement in their perception of cooperation throughout the learning process. Mr R and his peers' development of a positive perception towards cooperative work showed that learning under this paradigm had a strong influence and effects on his motivation, socialisation and achievement. Similar results were found in a follow-up meta-analysis conducted by Johnson and Johnson (2002) concluding that cooperative learning in comparison to competitive and individualistic learning also had similar effects on individuals' achievement, socialisation, motivation and personal self-development. These effects were visible in Mr R's case as his initial disinclination to socialise and work with others progressively changed.

Additionally, the face-to-face group's quality of inter-group relationships improved substantially when working cooperatively. The improvement in the quality of relationships was closely tied to the degree of emotional bonding that they developed with one another and which had a profound effect on their behaviour and ways of relating to peers. When positive relationships exist among group members, there is an increased feeling of productivity and satisfaction; personal responsibility towards the group's goals; and a sense of perseverance and interest in working to reach the group's objectives (Johnson & Johnson, 2006). This was also evident in Mr R's case when he stated that he "*likes researching to add some information [to the group] because I know that the students are*

going to add something else and I don't want to be the one who is not saying anything". Additionally, feeling committed to group work resulted in Mr R and his peers' improved psychological health. Psychological health refers to an individual's capacity to construct, preserve, and alter interdependent relationships with other members to accomplish the group's goals (Johnson & Johnson, 1989, 2003c, 2005). In Mr R's case, his psychological health improvement was reflected in his attitude change and willingness towards working with others and the types of relationships he was able to build throughout the sessions. Mr R's change of attitude from the initial sessions to the way he felt when these had finished, was evident when he said: *"I think it has been very useful in terms of learning, learning how to learn, and learn better in terms of researching and sharing with your classmates"*.

6.1.1 Focus groups' views on cooperative work

In addition to Mr R's case, the discussion held in the face-to-face focus groups concluded that the implementation of a cooperative approach had many advantages. It was perceived as a means of *"sharing your ideas, and helping your classmates"* (FG1/14-15). They also understood cooperation as a process in which *"your learning is being supported by the rest of the group"* (FG1/52-53); it is *"an approach where all the students, the groups, work together to achieve a higher goal"* (FG1/17-18). The face-to-face group's understandings of cooperation aligned with what Bertucci, Conte, Johnson, and Johnson (2010) claimed: group work has been shown to promote higher achievements than individual or pair work. Additionally, it has been established that students develop new content insights and establish greater elaborative cognitive understanding than they previously had when they need to reorganise and clarify the information they are going to explain to classmates (Wittrock, 1990)

Information in the form of explanations to peers corresponds to the group processing part of structured cooperative group work (Johnson & Johnson, 1990) which contributes to sharpening students' awareness of what is happening and enables them to see that they can be active in any decisions they make. Moreover, there is evidence that the process of monitoring the academic performance of others can improve the monitor's own task behaviour and academic skills (Topping & Ehly, 2001). Studies based in cognition have revealed that one of the most effective resources for the cognitive restructuring of information is for students to explain it to someone else (Slavin, 1995). Additionally, peer-mediated learning allows students to broaden their understanding of other peers considering social, educational, and adjustment requirements (Shachar, 2003; Stevahn & King, 2005). Another important aspect highlighted in the face-to-face group was related to

the importance that physical contact and presence has to learning. This was reflected in one of the focus groups:

[Y]ou know that feelings and body language are very important when you are teaching and learning something. When you are face-to-face you can express, show emotions, feelings, use body language; you use more than just words. We have to have in mind the feelings, body language, and the emotions that all the students bring with them to the class' (FG2/81-85); and they added: [cooperation] it's working together as a group to achieve a goal; it's basically working all together, supporting each other, giving ideas and exchanging information (FG1/31-36).

The inclusion of a presence component was considered an important aspect to establish a connection amongst members and for learning to occur. This theme was recurrently mentioned by focus groups' members in their comments. This reflection aligned with previous claims that knowledge is socially constructed from cooperative efforts (Vygotsky, 1978). Additionally, as a teaching strategy, group work fits neatly within constructivist approaches and features in curricular models such as peer assisted learning (Ward & Lee, 2005) and cooperative learning (Bähr & Wibowo, 2012). When students participate in dialogic interactions, they expose themselves to new ways of thinking and talking, hence building new understandings and learning (Mercer, Wegerif, & Dawes, 1999). The group work that took place in the face-to-face group ensured that their members established the relationships that enabled them to achieve the unit's goals. Working and learning in face-to-face groups can be theorised by using the *intergroup contact theory* proposed by Allport (1954). According to Allport's (1954) theory there must four important conditions for intergroup contact to be beneficial for students, namely, "equal group status in the situation; common goals; intergroup cooperation; and support of authorities, law, or custom" (Pettigrew & Tropp, 2005, pp. 264-265). Riordan claims that the term *equal status* is hard to delineate and it has been used in different ways. Cohen and Lotan (1995) argued that *equal status* refers to groups expecting and perceiving an identical rank in a given situation. The second key factor, *common goals*, involves an active, goal-oriented effort. The third key factor, *intergroup cooperation*, implies that for the group to achieve a common objective it is necessary that there is no intragroup competition rather than interdependent effort (Bettencourt, Brewer, Croak, & Miller, 1992). The final condition, *support of authorities, law, or custom*, refers to the fact that intergroup contact is more effective when it is supported by authorities and social institutions (Pettigrew & Tropp, 2005).

Allport's (1954) intergroup contact theory aligns with social constructivist views proposed by Vygotsky (1978) that intellectual development involves a social-interactive process.

Working under a cooperative approach in the face-to-face groups facilitated establishing these four factors. The structured groups were equal in component number and status, all of them searching for and sharing information to learn about The Sydney Opera House and Uluru-Kata Tjuta National Park. Additionally, groups' common goals aimed at the presentation of a role-play situation depicting the most relevant aspects in the construction of the Sydney Opera House and the creation of Uluru-Kata Tjuta National Park. Furthermore, group participants shared and cooperated with other groups, hence making use of intergroup cooperation guidelines.

6.1.2 Teacher's presence and cooperation development

Miss V's support was a key factor for cooperation to thrive. Her presence helped to develop the groups' positive perception towards cooperation. It was her initial constant presence which facilitated students' familiarisation with what cooperative work entails; she also provided the guidelines for cooperation to be established and welcomed within the groups. The teacher provided constant scaffolding and feedback in relation to the different tasks, hence facilitating objectives achievement and continuous students' motivation. In addition to the use of scaffolding and feedback, the creation of an affective environment was an important factor for learning to take place. The creation of an affective environment, has a favourable influence on learning (Weiss, 2000). Students reflected on this when they said: *"Also, something very important was the energy that she [Miss V] put in all the sessions, because she was all the time willing to create a nice, a nice affective environment"* (FG2/31-33).

The way in which Miss V guided the discussion within the groups, the attention she paid to each student, and the good affective environment she created, were important elements that helped engage learners' confidence. Additionally, the establishment of a power relation element can explain the reason why cooperation was embraced by these students in the face-to-face group. As previously explained, the use of a teacher-centred model in the Chilean context has been widely used (Preiss, 2009). However, students being presented with the possibility to be in control of their learning and make their own decisions was an engaging element. Power relations can be approached by using the principles of classification and framing (Bernstein, 2000). Classification relates to the strengths and weaknesses between border categories such as phases of school and subjects. Framing indicates who has control over, for example, sequencing and pacing the teaching and learning interaction (Bernstein, 2000). When the control is with the teacher

the framing is strong, whereas in weak framing the student appears to gain more control (Bernstein, 2000).

The establishment of a weak framing during cooperative group work was a motivational element as this was a novel experience for these students. As the teacher's presence was gradually withdrawn, Mr R and his peers progressively took control of their own knowledge construction, thereby increasing their autonomy. In a context like this, it is the learner who knows what knowledge has been grasped as well as what type of information needs to be clarified (King, 2008). Additionally, that it is the learner who is the most suitable person to identify his or her own information gaps and select the most relevant and appropriate information to complete them (King, 2008).

King (2008) has also pointed out that teacher-generated questions may or may not meet a learner's need. However, it is presumably those questions produced by the individual learner that are the ones that are of extreme value to promote that learner's own learning (King, 2008). Additionally, when individuals produce their own answers during the learning process, those answers are compatible with her or his own knowledge and background, hence being more easily recalled by that specific learner (King, 2008).

Allowing the students to decide on what they learnt was an empowering experience that accounted for their increased positive perception towards the use of cooperation. This was indicated in the cases of Mr J and Mr R when their respective teachers allowed them and each of the participants to decide on the different roles they wanted to have within their groups. In like manner, the virtual group also developed a positive perception of cooperation which was prompted by the inherent characteristics of the Second Life environment as well as the role the teacher played in cultivating a cooperative environment. As explained in the case of Mr J, the sense of community that developed in the virtual group, enhanced by the visualisation and feeling of immersion that participants experienced in this environment, contributed to positively embrace cooperative group work.

6.2 Virtual group's perception of cooperative work

Similar to the face-to-face group, Cooperative Learning Questionnaire results showed that the virtual group also developed a positive perception of cooperative group work. In the virtual group, Mr J made it clear that learning under a cooperative approach was a new paradigm that he would replicate because it was "*not only centred in the learning process,*

but the student's". He also brought up the idea of how cooperation "*helps you to have the self-esteem to know that you can do something by yourself, not just be given the information*" (I3/25-26). Mr J's claims are supported by that of Sharan and Shaulov (1990) considering that students' common work and interaction enable their reciprocal learning as well as promotes autonomy over tasks to be completed and decisions to be made.

The sense of autonomy that the Second Life environment favoured in the virtual group was based on the weak framing power relationship (Bernstein, 2000; Lotan, 2004) that was established between the teacher and the participants. The resulting weak framing was fostered by the indirect face-to-face interaction that occurred in Second Life and which assisted to lower inhibitions in shy students. This feeling of autonomy in the virtual group developed as an affable climate was established among the participants and teacher as described in the case study. Additionally, an environment which is characterised by "low threat, unconditional positive regard, honest and open feedback, respect for the ideas and opinions of others, approval of self-improvement as a goal, collaboration rather than competition" (Candy, 1991, p. 337) promotes autonomy. The development of autonomy does not happen in isolation, but in a social context as was the case of the virtual participants. Being responsible for and contributing to the rest of the groups' success increased their responsibility to complete tasks and meet the class objectives. This aligned with Dam's (1995) claim that autonomy involves the "capacity and willingness to act independently and in cooperation with others, as a socially responsible person" (p. 1).

In addition to that, and as explained in the case study, Miss A constantly reinforced the use social skills and positive interdependence (Gillies, 2007) by continuously scaffolding participants with the use of *inviting student participation* and *procedural scaffolding* (Hannafin et al., 1983; Roehler & Cantlon, 1997). This occurred within the early stages of the access and motivation and online socialisation (Salmon, 2011) stages in the Second Life environment which contributed to a better establishment of cooperation in Second Life. These elements are simultaneously enhanced by the teacher as it is proposed by the use of the framework presented.

Learners need a supportive environment in order to learn to be more independent. Cooperation assists in establishing this supportive environment, and consequently helps to promote learner autonomy through enhancing self-esteem and self-confidence; increasing motivation; encouraging learner responsibility for learning; and enhancing self-management skills (X.-s. Wang, 2010). Students' group work was enhanced by promoting

positive interdependence (Gillies, 2007) within the simultaneous use of online socialisation (Salmon, 2011) in Second Life and the constant use of procedural scaffolding (Hannafin et al., 1983) as explained in Mr J's case.

From a motivational point of view, making students responsible for their own learning enhances learning outcomes, since their autonomy and intrinsic motivation are increased (Reigeluth & Stein, 1983). Additionally, and from a cognitive point of view, when students are responsible for their own learning they are prone to choose, encode, and retain the new information based on their own previous understanding (King, 2008). The lack of extrinsically established conceptual organisers makes that information more pertinent to the learner hence more meaningful (King, 2008). Empowering learners to be responsible for their own learning is a characteristic that is supported by the Second Life platform:

[I]f you believe you are there [in Second Life] to tell students what they need to know, the learning experience for students is likely to be less positive than if they are seen as co-creators -so the learning is interactive (Savin-Baden, 2011, p. 85).

Savin-Baden (2011) emphasises that using Second Life for learning requires a focus on understanding and developing in-world interaction, as it is crucial to recognise that this interaction moves students away from hierarchically structured decision-making led by teachers to the use of teamwork. This view on how learning is to take place in Second Life concurs with Miss A's way of conducting all of the sessions to learn about Australia. She had a pivotal role in the virtual environment of Second Life by mentoring students and helping them to adjust to and familiarise themselves with this way of work, and learning by weaving and making constant use of the elements within the presented framework. Additionally, she also provided constant scaffolding and feedback which was a motivational element as stated in one of the focus groups:

I think that by having the guide of the teacher [Miss A], she facilitated thinking about your objective; to do things related to the objective, and the final goal. For me, I think, it was important' (FG3/50-52). Another student stated 'she gave a path for the students to follow' (FG3/55). Another student reflected 'and she always motivated us when we did a good job by saying 'well done', which was excellent (FG3/61-62).

Development work by Truelove and Hibbert (2008) suggested that scaffolding is helpful when preparing students to learn in Second Life as students find "the initial tutorial phase overwhelming, reporting feelings of confusion and anxiety, whilst failing to see the purpose of this virtual world" (p. 363). However, and in spite of the benefits of scaffolding, its use can also hinder the playfulness of learning. It is probably more effective to encourage students to play and explore in Second Life, change their appearance and acquire things

from freebie places than to scaffold the learning time (Truelove & Hibbert, 2008). This self-learning phase may be beneficial, especially when students like to change their appearance, understand moving and flying, and work out how to build things on their own. This also contributes towards enabling a power shift to occur away from staff being in charge, toward more creations of dialogic spaces for learning that have a greater sense of cooperation and collaboration than scaffolded spaces (Savin-Baden, 2011).

6.2.1 Teacher's presence and cooperation development

Similarly to Miss V, Miss A's constant encouragement and the establishment of good relationships with the students contributed towards participants' engagement in cooperative group work, the tasks, and the development of a sense of community; elements of the framework within which she worked in Second Life. Miss A's presence was considered to be a pivotal element for learning to occur, as one student reflected:

About having a teacher, I think that it's necessary. Even though this is an active process in which students have to create their own knowledge, I think that, obviously, you have to have a teacher, because you have to know the steps that you have to follow to achieve the objectives. So, I think that if you want to reach your objectives you have to have a teacher...besides she is always asking about what we have learnt, what the activities are, because we always have to do something different, like a new activity, which is good (FG2/36-40).

Besides Miss A's important role to facilitate the learning process, she also contributed to help develop a sense of community within the virtual group. Additionally, her constant reinforcement of the framework elements of *online socialisation* (Salmon, 2011), participants' *positive interdependence* (Johnson & Johnson, 2006) and *procedural scaffolding* (Hannafin et al., 1983) facilitated the establishment of the sense of community and cooperation in Second Life. This was acknowledged by one of the participants in a focus group interview:

I feel as part of this community, because I think we are connected to it. I think that I feel really connected and represented, and I feel that I am into it, and this has helped me to learn in a better way... and I think that if one day, for example, I have a problem or whatever I think that they are going to miss me as well as I'm going to miss someone who cannot come and who is working regularly (FG3/25-29).

The teacher's presence in the Second Life environment triggered a sense of involvement, guidance, and group attachment as it was reflected in these students' claims. The teacher played a paramount role in the development of group ties and provision of learning directions. The idea of having a virtual teacher was determined by constructivist learning ideologies that explain how learning is facilitated through proactive cooperation and

support (Zhang, 2002). The fact that learning requires participants to be active, independent agents (Zhang, 2002), was reflected in the way in which the sessions were conducted by Miss A in-world as it has been indicated in the case of Mr J. This also supported the establishment of a constructivist approach within the virtual group. Additionally, technology supported learning offers varied opportunities for constructivism to occur (Zhang, 2002). This was evident in the use of the Second Life platform where this type of environment supported a student-centred approach; interaction among peers; and provided learners with a variety of resources.

6.2.2 Focus groups' views on cooperative work

The discussion about the importance of cooperation that took place in the focus groups held with virtual group participants, reached similar conclusions to the one in the face-to-face group. For the virtual group, cooperation was *“all about working together so we can help each other. So, that is the main goal, to learn how to work together”* (FG1/42-43). Virtual participants also thought of cooperative learning as *“a way to share ideas, to share knowledge with our partners, and study with them in order to achieve a higher goal”* (FG1/8-9). Their ideas about cooperation aligned with those of Johnson and Johnson (2000) and Slavin (1995), considering cooperation as a way of promoting socialisation and learning.

In addition, and similarly to what was expressed in the face-to-face group, the virtual group also considered the presence component to be an important factor to establish an effective cooperative work environment. This was made clear when they reflected: *“it's hard to work with others when you are not seeing those people to their eyes”* (FG2/22). However, considering that Second Life provided a sense of immersion for meaningful learning, it helped ameliorate the lack of direct physical contact which was the essence of the face-to-face group. Additionally, the use of avatars also contributed to students experiencing cooperation positively, as one student reflected.

I think it was a very good instance for me to interact with a lot of people by means of my avatar. I felt very good, and in a very good environment because we were working with classmates, so it felt great, and also because it's a very good experience and I learnt a lot about Australia. This also involved social aspects of working with a group. I think that the virtual environment has more advantages than face-to-face interaction, because I think that you feel freer, you feel better than interacting face-to-face. I think that face-to-face work takes time to physically go to one place, but if you are in Second Life, this is not the case. You can work with a lot of people and it's good, because I feel represented by my avatar and...I can do whatever I want there [Second Life], so I think that's better, also because you can develop some abilities that you thought you didn't have before... (FG3/80-89).

This participant's reflection expressed the sense of freedom and interaction that working in-world triggered in him and which lessened the limitations of physical constraints that are usually experienced when working in a face-to-face environment. Further, the framework elements of *promotive interaction* (Johnson & Johnson, 1999) and *information exchange* (Salmon, 2011) supported interaction and cooperative group work. Additionally, and as explained in Mr J's case, the use of emoticons was also an important element that added an affective component to the chat conversations that were held in the virtual environment. These factors contributed to an increased sense of group belonging. The participants' comments and opinions are aligned with Warburton's (2009) study on avatar's actions and norms in Second Life. In his research he showed that it is possible to cultivate a sense of group cohesion and community despite the lack of physical presence (Warburton, 2009). His results showed that Second Life avatars behaved similarly to real-world people in terms of keeping distance in social relationships, and eye contact (Warburton, 2009). Additionally, virtual group participants' perceptions of community were aligned with Garrison and Vaughan's (2008) claims. According to these authors the development of a community atmosphere is associated with levels of perceived learning (Garrison & Vaughan, 2008). Further, that perceived learning correlates with a strong sense of classroom community (Rovai, 2002). Classroom community is robust when learners: share similar principles and interests; engage in dialogic interactions eagerly; assist and believe in each other; have similar learning objectives; have constant communication amongst them; and the interrelationships between the teacher and students are strong (Rovai, 2002). Most of these characteristics were present in the virtual group as participants felt connected to the teacher and their peers; shared common interests; engaged in two-way communication through chat; and their common learning objective was to learn about Australia.

In spite of Second Life providing an enhanced learning space, it is also necessary to acknowledge technical issues that may have resulted in a less satisfying learning experience and perception of cooperative work. The inability to establish voice conversations due to low internet speed, which also caused interface lags, and the difficulties to express emotions as it happens in face-to-face interactions may have lessened these students' development of cooperation in the virtual realm.

According to the statistical analyses conducted for this study, neither face-to-face nor virtual environment participants' perceptions of cooperation were influenced by the cooperative learning sessions. It has been proposed that professional learning activities

can produce fundamental changes in teachers' beliefs, knowledge, and practices (Lumpe, Czerniak, Haney, & Beltyukova, 2012). However, these changes can be negatively affected by too short a duration of a professional development program (Borko, 2004). Similarly, in the present study the short timeframe participants were exposed to cooperative learning (only one academic semester) may have affected these perceptions.

Nevertheless, the qualitative information that was gathered from participants in the focus groups and case studies stated otherwise: it revealed a different reality, one that showed that putting learners in control was a valid way to produce substantial changes in a person's mind-set on how to develop cognitively. Participants accepted cooperation as a valid way to construct knowledge, and in both case studies they expressed their intention to use a cooperative approach to teaching in their future professional practices. Similarly, the teachers recognised cooperation as a valid way to help students create their own knowledge. These opinions uncovered a different reality and subtlety that numbers cannot portray. Despite the fact that there are many advantages of using a cooperative approach for learning, its implementation poses certain difficulties.

6.3 Research questions

From the comparison of achievement test results between both groups, it is possible to address the following research questions:

6.3.1 How effective is the use of a 3D virtual approach to teaching about historical events when compared to a face-to-face, cooperative learning approach?

Undoubtedly, learning in the immersive environment of Second Life gave virtual group participants a wholistic, more vivid experience of what learning about a different country is. Mr J clearly acknowledged that when he said "*with the virtual environment, you remember the colours, the things that you saw there so... and the animation that the platform [Second Life] brings to you, makes it more enjoyable because it is not just showing you a PowerPoint, flashcards or a video, you are there!*" (I2/358-361). In the focus groups, one student also referred to it by saying:

It [Second Life] also gives you the opportunity to lead what you are studying. In this case, we studied 'the Opera House' and 'Uluru' and we were able to see that. We were able to know more about those places and see them at the same time. So I think that in this case is meaningful because it gives you the opportunity to get close to what you are learning; it's not the same as reading a history book compared to being in there in the virtual environment (FG3/47-52).

Students had a hands-on learning experience which is reflected on the information obtained from the interviews. These claims aligned with what Warburton (2009) stated in relation to VWs characterising them as environments which “provide and experience set within a technological environment that gives the user a strong sense of being there” (p. 415). Warburton has also declared that the Second Life environment features an enhanced visual and physical component which makes participants experience a sense of immersion and co-presence, especially when interacting with and in the presence of other avatars. Comments from case study participants in the virtual environment were aligned with Warburton’s (2009) suggestion when stating that the realism the Second Life environment has made them feel immersed in and connected to other participants, as if being with them. In addition, within the Col model teacher and student capacity to interact, as if being present, is an essential element for productive learning interactions (Warburton, 2009). The data obtained from interviews and focus groups are aligned with Warburton’s claims.

Warburton and Perez-Garcia (2009) have pointed out that better content knowledge learning can be achieved through Second Life and its affordances, namely: content production; simulation; extended interactions; contact with genuine-like culture and content; community presence; immersion; visualisation and contextualisation; and personal and shared identity play. In this particular study, visualisation and contextualisation and immersion had a pivotal role as those Second Life features allowed participants to access content that was unreachable for them and which led to a more meaningful learning experience. This aspect of the study was aligned with the claims established by Warburton (2009) in the sense that Second Life allows for the “production and reproduction of inaccessible content that may be historically lost, too distant, too costly, imaginary, futuristic or impossible to see by the human eye” (p. 421). Additionally, this pre-service teachers’ experience aligned well with the advantages outlined by Savin-Baden (2011) about the use of Second Life in higher education. The advantages proposed by Savin-Baden (2011) contributed to make the learning experience more effective within this study by providing a realistic immersive setting where participants were able to visit places that it was difficult for them to access and experience situations such as interacting with English native speakers first-hand. As stated, visualisation played an important role in enhancing these participants’ learning experience, as it was the result of better content knowledge gain that was reflected in participants’ achievement test results. These results are in line with contemporary learning theories which highlight the

significance of students learning within authentic learning contexts and having the chance to improve their critical and creative aptitudes by means of constructivist learning (Mims, 2003). Undoubtedly, Second Life made the process of learning about the Sydney Opera House and Uluru more immersive as it helped students “connect” with the contents, as one of them referred to:

The immersion, the connection has been great. I think that I have learned a lot. I think that sometimes you don't have the time or the opportunity to talk with people when you are face-to-face. In this program [Second Life] you can talk with them about some specific information and you can interact; it is better, it has been good for me...yes, it has been great! (FG3/416-419).

It was interesting to know that, in this student's particular circumstance, Second Life facilitated communication with others by allowing him to establish open communication channels with the teacher and peers by means of its chat affordance as it was explained in the case study. This showed that Second Life still enhanced the social presence aspect although to a lesser extent than the face-to-face group.

The research question being discussed, *how effective is the use of a 3D virtual approach to teaching about historical events when compared to a face-to-face, cooperative learning approach?*, can also be addressed from a connectivist perspective. In this study the content to be learned was stored and manipulated by technology, in this case the Second Life platform, which allowed individuals to learn more effectively than their face-to-face counterparts. According to connectivism, knowledge is distributed across an information network and can be stored in a variety of digital formats. Siemens (2008) has established that learning takes place by including both cognitive and affective components; cognition and emotions contribute to the learning process. It was being part of a network of knowledge that allowed virtual participants to learn and remain current through the connections they formed in-world. The conversations held in Second Life amongst peers and the teacher allowed participants to constantly build and update their knowledge of the two topics.

Additionally, the novelty factor associated with the Second Life platform may help clarify the reason why virtual group participants had an augmented and more effective learning experience. In this particular case, and according to Grandjean and Peter's (2011) categories, perceptual and contextual novelty played an important role since there was construction of a new representation of an object, and perception of objects in a new context respectively. Both of these types of novelty were appealed to by the use of the

Second Life virtual world. It has been claimed that there is an initial novelty effect for any new technology used which enhances engagement with the topic being dealt with. One contributing factor to engagement is the direct real-time feedback which reduces students' levels of distraction, since it allows them to seamlessly flow on to the next task at hand rather than idling in class, waiting for feedback before moving on (Leichtenstern, André, & Vogt, 2007). Similarly, the teacher in Second Life provided this synchronous kind of feedback throughout the sessions as explained. From a Piagetian point of view, novel situations have an influence on the ways of assimilating and accommodating new experiences that the learner is faced with. This aligned with Flavell's (1985) assertion that to keep the equilibrium and develop new knowledge, it is necessary to maintain the balance between the assimilation and accommodation processes. In this study those new experiences were caused by the use of the virtual environment and the experiences participants lived in-world by using the avatar.

Notwithstanding, one of the drawbacks of implementing a new approach in the classroom is that no negative aspect of it can be perceived and students have the tendency to welcome it. Additionally, the downside of using new technology relates to the use given to it: if the new technology keeps on being used in the same way for long periods of time, the novelty effect wears out and so will the benefits. However, if technology is used inventively, then that novelty will diminish gradually (Heussner, 2010). In the context of this study, this has been the case with the teacher in the virtual group as she is still using the Second Life platform in her current teaching, as she expressed in a follow up interview

I am still using Second Life in my class and students love it! Second Life has given me the opportunity to take my teaching one step further into making the class definitely more engaging and meaningful for them. Giving the students a hands-on, vivid experience is a really important part of the learning process.

Her comments reflected that the novelty factor that Second Life provided these students with has not worn out, but on the contrary, it keeps on providing the necessary environment for learning to flourish. This has been due to the fact that the islands being used in-world have been changed even though the Second Life platform keeps on being used reiteratively. The use of different islands has kept the students enthused about learning in this environment, hence keeping the novelty effect amongst them. The teacher's use of Second Life has enabled students to learn in a real-like context which has permitted them to relate the learning process to the real world. This was reinforced by the constant connection the teacher made with previous background knowledge.

Overall, this data set on students' tests results showed how effective the utilisation of a 3D virtual environment was when compared to a face-to-face one, because of the confluence of different factors. First, the profound immersive experience that the technological environment provided students with was due to its visualisation and contextualisation affordances, as it provided participants with content that may have otherwise been inaccessible. Second, the opportunity that participants had of having constant access to updated information and knowledge. This was the result of information and knowledge stored in Second Life being part of a ubiquitous digital network. Thirdly, the novelty effect that was experienced when exposed to new ways of learning. Perceptual and contextual novelty played a crucial role in giving the students a heightened sense of immersion and the possibility to connect with the contents in a more meaningful, hands-on way. Second Life and its novelty effect were decisive in triggering the recall of new information in the students. This was indicated by Mr J and virtual group participants when they expressed they had never learned in a VW setting and highlighted that every place they visited was so realistic as if "being there". It was part of this novelty effect which caused cognitive dissonance in the students: the assimilation and accommodation of new information to their already existing schemes allowed in the students the achievement of new understandings and equilibrium. Finally, co-presence was an important element which allowed both teacher and students to project themselves into the Second Life platform to cooperatively construct new knowledge and understandings of the topics being dealt with. This was possible due to the use of avatars, which enhanced the physical representation component in the Second Life environment. The learning experiences that both groups went through related to the secondary research question:

6.3.2 What are the differences between students' learning in a traditional face-to-face cooperative learning environment versus an online 3D cooperative learning environment?

The first difference between the two groups was the type of environment in which the cooperative learning experience took place. The group working face-to-face was bound to a classroom environment while the virtual group experienced the boundless space that Second Life supplied them with. Virtual environments such as Second Life provide a wide variety of choices that assist not only learning but also the collaboration process (Smart, Cascio, & Paffendorf, 2007). Further, that in the Second Life platform learners can be in control of exploratory events; have an optimal location to meet; and exchange files and documents (Grant, Huang, & Pasfield-Neofitou, 2013). Additionally, immersive learning spaces such as Second Life are universal, not bounded by time or geography and, in

particular, adopt different learning values from other learning spaces (Olsen et al., 2004; Savin-Baden, 2007a).

The work that took place in the face-to-face group aligned with a student-centred curriculum model. It has been established that in this kind of model “students exercise a substantial degree of responsibility for what is taught, how it is learned, and for movement within a classroom” (Cuban, 1993, p. 7). Additionally, in this type of classroom setting the educational process occurs in small groups; furniture is organised to facilitate students’ group and personal work; and learners’ talk is considerably more abundant than that of the teacher’s (Relan & Gillani, 1997). According to Relan and Gillani (1997) students can help in the decision of content to be learned and instructional materials to be used; and there is a variety of teaching materials to assist the individual or group learning process. Furthermore, Mascolo (2009) has pointed out that in a learner-centred approach the teacher is not the fundamental source of information in the classroom but a mediator who helps students construct their own knowledge, hence the necessity for students to be dynamic and proactive.

In addition, a conventional face-to-face classroom is confined to a physical space which may include a school, a classroom, and other places (Relan & Gillani, 1997). From Relan and Gillani’s perspective, the face-to-face group worked under a traditional classroom approach, physically bound, although cooperation enabled them to work under a student-centred curriculum model.

On the other hand, the group working in the Second Life environment was not restricted by physical constraints and they experienced an enhanced sense of immersion. The Second Life groups’ claims aligned with Sanders’ (2007) who expressed that the immersive nature of VWs, and their unique space and time features make these environments student centred and engaging. Sanders (2007) has also specified that in these spaces, students can experience presence as a consequence of using the avatar to move and explore the places around them. Further, that this enhanced presence gives students the opportunity to relate to other participants not only within an educational context, but also in casual encounters, since students move around from one location to another (Sanders, 2007). The author also stated that the flexibility students have to meet others, and the possibility to interact both formally and informally, should not be undervalued (Sanders, 2007). Consequently, the Second Life environment features provided virtual group participants in this study with enhanced interaction, which resulted in an enriched learning environment.

Additionally, knowledge construction in Second Life was also complemented by the sense of individual accountability (Gillies, 2007) that Miss A promoted in the students as well as the simultaneous use of strategic scaffolding (Hannafin et al., 1983) which allowed participants to identify important information which enriched their learning.

The ease of content access in both types of environments was another important difference experienced by the two groups. As explained, the face-to-face group students worked in, and were bound to, a traditional face-to-face classroom space within a physical boundary. For these students this meant being subjected to physical mobility, distance, and time constraints to allow timely attendance at the weekly sessions at university. The other group had the ease of accessing the learning environment from home or any other location of their preference. Zhang, Zhao, Zhou, and Nunamaker (2004) have pointed out that within a traditional classroom setting, students are able to listen to the teacher and watch visual material at the same time, hence an online environment should characterise identical levels of simultaneous online content.

The virtual environment setting of Second Life provided more than just various online contents; it provided a sense of total synchronous immersion which was positively valued by the participants as explained. It was the flexibility of access that Second Life provided participants with which resulted in extra motivation and engagement when compared to the traditional face-to-face classroom environment. In addition, accessibility to content in a different format in both types of environments was another difference that both groups experienced. In the group working in Second Life, the content they were presented with was a 3D virtual recreation of the places to be studied and explored by the students. They had complete access to explore and navigate these places by using their avatar embodiments in Second Life. On the other hand, the face-to-face group had access to online encyclopaedias, websites, and videos. These disparities in the types and quality of content accounted for the difference in knowledge outcomes at the end of the sessions. As previously mentioned, the different content format that the virtual group had access to such as content visualisation; immersion in a real-like environment; and interaction with in-world residents made the learning experience more first-hand and meaningful. The type of learning experience that occurred in Second Life resulted in more memorable content recall for learners when compared to the face-to-face group.

Warburton and Perez-Garcia (2009) have proposed that Second Life's educational affordances create the ideal environment for individuals to interact among themselves;

with artefacts; communities; and even among intelligent artefacts. They argued further that Second Life permits users to contextualise and visualise content through its reproduction. It is the recreation of remote content which permits users to get in contact with real-like materials and experience a sense of immersion (Warburton & Perez-Garcia, 2009). Additionally, Second Life allows simulation of contexts that may be, otherwise, impossible to replicate in real life (Warburton & Perez-Garcia, 2009).

Salt, Atkins, and Blackall (2008) have proposed that it is the 3D graphical richness of the Second Life environment, as well as the possibility for users to customise their physical aspect and behaviour, which makes it more engaging and fun. The researchers have also pointed out that Second Life is an appropriate place for the development of emotional closeness, immediacy, and shared experiences (Salt et al., 2008). On the other hand, and in spite of the face-to-face group having access to the resources previously named, it was their inherent limitations, compared to the Second Life environment, which may have hindered their learning. It was the lack of interactions beyond the classroom context that made the face-to-face group learning experience to be more flat, linear, and not as “colourful” as the Second Life group.

There is a close connection between the type of content that is accessed and how meaningful and personal the learning experience may be (Salt et al., 2008). It has been established that subjects get to know their world in two ways (Winn, 1993). First, individuals get familiar with their environment as a consequence of their daily interactions with it (Polanyi, 1958). Second, that daily interaction results in implicit, subjective, personal knowledge; individuals are not aware that they know something (Polanyi, 1958). Third, individuals can also become familiar with their world through descriptions provided by another person. This knowledge is explicit, communal, and objective; always taught to the individual by someone else (Winn, 1993). According to Clancey (1993) it is the “first person” experiences, the ones that are conducive to the subjective type of knowledge, whereas experiences that are conducive to objective knowledge are labelled as “third person”.

VW immersion allows the individual to eliminate the subject-object barrier that stands between the user and machine (Bricken, 1991). The researcher also indicated that once the user-machine barrier has been removed, the knowledge and experience obtained from a VW can be of the first-person type (Bricken, 1991). In addition, Winn (1993) claimed that virtual immersion allows individuals to construct knowledge that, until now, was possible

only through direct interaction with the world, leaving behind third-person experiences that are restricted to a school environment. Hence, participants working in Second Life had this first-person learning experience due to the features of this learning environment. Those students working in the face-to-face group had a third-person type of experience which was attenuated by the cooperative approach that was used. However, accessing specific content in both types of environments had a requirement that was associated with the students' level of technical skills.

In the face-to-face group the required level of technical knowledge was not a relevant element as it was for the virtual group. For any virtual environment to be a success it is imperative that a well-defined and clear cut training program is provided not only for students but also staff (Hénard & Roseveare, 2012). On the one hand, some lecturers may be apprehensive at having to learn a new system. Others, who are more technologically confident, may engage more readily but they still have to invest a great deal of time to design and change their present material to a new paradigm of interaction and delivery (Capanni & Doolan, 2011).

Miss A was eager to adopt Second Life as a teaching tool as it has been explained previously. On the other hand, students must also be trained on how to use the system if they are expected to be fully engaged. Such was the case when students in the virtual group attended training sessions to master the basic skills in the initiation island "Lionheart Pumbaa" as explained. It may be possible to believe that virtual environments are intuitive and easy to understand. However in many cases students' interaction with such systems, and their fundamental understanding on how they work, is severely deficient; this is especially prevalent in the case of non-computing students (Capanni & Doolan, 2011). If such training does not take place, there is a risk that not only students, but also teachers or lecturers, suffer from technical or computer anxiety causing feelings of apprehension in-world. As explained, the face-to-face group required a lower level of technical knowledge to access the different materials that were available for them in websites. This implied that their access was smoother and did not require training since they were familiar with websites and how to access their context. However, and as shown in the test results, this had a somewhat negative impact on their experience as this less engaging content did not provide a learning environment as compelling as the virtual environment. In spite of the fact that web-based content can promote experiential learning (Relan & Gillani, 1997), their use in this case showed to be less engaging and memorable when compared to the Second Life experience.

Another aspect to be considered as an important difference in the learning experiences between both groups was that of inhibition related issues. Inherently, humans have a basic need and desire to socialise (Capanni & Doolan, 2011). However, many can find it difficult to interact socially with new people. Students rarely have the self-confidence to stand out from the crowd and answer a question, and the main reasoning behind this is fear; the fear of being incorrect and the fear of what their peers may think (Capanni & Doolan, 2011). The face-to-face group worked under a cooperative approach that enhanced their development of group community by making use of the appropriate social skills and promotive interaction. Cooperative work had positive effects as it caused inhibition to be lowered as students were encouraged by the teacher to participate and share their knowledge in class.

Similarly, those students in this study who were working in the VW also benefited from a sense of lowered inhibition. Getting students to interact in a lecture room environment can often be very difficult at best (Capanni & Doolan, 2011). Hence, for those who may be unable to partake in real world interactions due to physical or mental constraints, online VWs can supply the essential environment to channel their needs (Capanni & Doolan, 2011). In this case, the anonymity of interacting with others through the use of avatars provided a level of security that they would have not encountered in the real world. Furthermore, people interacting through the use of their avatars have fewer inhibitions and are more willing to express themselves without worrying about what others may think (Capanni & Doolan, 2011).

However, in a study conducted by Hoyt, Blascovich and Swinth (2003) on co-presence, they examined social inhibition in the presence of avatars and agents. In their study, the term avatar described a graphical character under synchronous human control. The term "agent" referred to graphical characters controlled by a computer program or artificial intelligence algorithm. Interestingly, in their study, the researchers found that "the greater the sense of co-presence avatar users reported experiencing within the virtual environment, the more the presence of others influenced their behaviour" (Hoyt et al., 2003, p. 192). This showed that even in virtual environments participants can experience social inhibition when being observed by others (Hoyt et al., 2003). The sense of realism that is enhanced in these immersive virtual environments influenced participants to behave in the same way as they would in the physical world (Hoyt et al., 2003). Hoyt et al.'s (2003) study is in the same vein as that of Warburton's (2009) in the sense that they identify

Second Life as a virtual space that produces a profound immersive experience paired with a feeling of co-presence when interacting with other avatars.

Nevertheless, both groups also shared some similarities when learning about Australia in both environments. The first similarity was that both worked under a cooperative approach to learning. Working under structured cooperative groups is not commonly used in pre-service teachers' programs in Chile (Preiss, 2009). Results in this study are aligned with Relan's (1997) claims that when working under a cooperative approach teachers "dethrone" themselves as information transmitters; they become guides who help students find, evaluate, and make sense out of the plethora of information they access through different media. Similarly, both groups worked under teachers and their guidance. This resulted in different benefits as it has been described in the case studies.

In summary, all participant students shared similarities and had differences when working in their respective groups. Each environment set different boundaries within which learning took place. The classroom environment for the face-to-face group was circumscribed to a physical space that aligned with a student centred curriculum thanks to the use of cooperative learning. Cooperation supported group work and the development of a community feeling which ameliorated the lack of interaction with external participants. In contrast, the virtual group enjoyed the boundless possibilities that Second Life offered them with; possibilities to interact with others not limited by space or time. Cooperation also enhanced their learning experience similar to the face-to-face group.

In addition, access to content for both groups marked a difference. Physical issues such as transportation and distance were experienced by the face-to-face group while the virtual group had access from home or another location of their preference. In the same vein, the type of content participants had access to also differed. 3D virtual recreations of the places to be studied created the environment in which the virtual group learned as compared to websites and videos that the face-to-face group used. This resulted in students having a meaningful, "first-person" type of learning experience or a "third-person" one. Accessing content challenged participants according to their level of technical expertise with the "first-person" experience requiring more knowledge than their counterparts. Equally important was the level of inhibition that students experienced when learning. The face-to-face group had a lowered sense of inhibition thanks to the cooperative approach being used. Similarly, virtual participants were also able to express themselves as VWs can provide an adequate environment for shy people to express themselves.

On the other hand, the similarities that both groups shared included the use of a cooperative approach to learning which allowed group participants to learn under a student-centred paradigm. Similarly, both groups experienced technical issues when trying to access content with different degrees of complexity. Finally, in both types of environments there were teachers guiding the learning progress. Their presence facilitated students' learning process by monitoring and guiding it; this in turn enabled participants' knowledge construction.

Following the research question of *“does learning occur to a greater degree in a 3D virtual world or in a face-to-face structured cooperative group?”* was answered based on the achievement tests results from students working in both types of environments. It aimed at gauging the effectiveness of a 3D virtual environment in comparison to a face-to-face one to learn about Australian historical events and geographical aspects.

6.3.3 Does learning occur to a greater degree in a 3D virtual world or in a face-to-face structured cooperative group?

Based on the test results it can be claimed that content learning was better achieved by those students who participated in the virtual environment when compared to the face-to-face participants. The ANCOVA analysis showed that the virtual group scored significantly better the second time in the achievement test. The present study yielded similar results as those in the study conducted by Dede (2009) where the students in the immersive simulation environment outperformed their face-to-face fellow participants. In spite of virtual participants acquiring and gaining more content knowledge, as per test results, it is essential to emphasise that students scored better results the second time regardless of the type of environments. The use of a cooperative approach to teaching and learning can be considered as the main reason for this learning improvement to have occurred. As previously explained in the case studies, this different way of learning was an enticing element for both groups. The shift from a teacher-controlled classroom to a student-centred paradigm was a key element for learning to be enhanced and take place. Additionally, the use of an immersive environment such as Second Life gave these participants a heightened learning experience which resulted in better test results. Miss A had a key role in improving the whole learning experience in the virtual environment of Second Life as explained in the case study. This relates to the research question:

6.3.4 What effect does the teacher have in virtual environments (Second Life) to learning?

In this study, the teacher had a positive impact in the utilisation of the Second Life environment. This claim is based on the information gathered from the focus group discussions and interviews. *Content engagement* was the teacher's first positive effect within the virtual environment. Everything about the constructivist approach to learning aims at highlighting the relevance of learners getting involved as closely as possible with the content to be learned which includes "doing" something with it (Pritchard, 2009). It is this "closeness" that is referred to as "engagement". Engagement has been described as "the time during which students acquire information and engage in an experience that provides the basis for, or content of, their ensuing learning" (Pritchard, 2009, p. 30). Engagement also involves exploration of the new content; to pair and contrast; to argue and discuss in groups or pairs; to answer questions and discover new things; and to write, as well as other similar tasks (Pritchard, 2009).

These tasks were encouraged by the teacher throughout the sessions and they facilitated both engagement and exploration, which resulted in further content engagement. Additionally, engagement was fostered by the teacher's creation of an affective environment as previously explained in the case study. Encouraging students' sense of curiosity; the use of humour; and a feeling of mystery and surprise are essential elements which aid to create biochemical connections between memory and emotions (Cain & Cain, 1994). These were some of the strategies that Miss A made use of to foster engagement in the participants. Moreover, Miss A and the students set off on constant excursions in Second Life which helped her to engage them in different ways. She prompted students to relate their previous knowledge to what they were experiencing; she motivated them to teleport themselves to different places; she promoted finding answers to the questions she had posed earlier; and encouraged them to socialise and mingle with other in-world participants.

All of these activities triggered discussion and information exchange in the students which resulted in the construction of new knowledge. Students' sense of curiosity was also appealed to by these teacher actions in the Second Life environment. As explained in Mr J's case, information exchange was supported by the continuous use of procedural scaffolding (Hannafin et al., 1983) and promotive interaction (Johnson & Johnson, 1999); elements within the proposed framework which promoted cooperative group work in Second Life

By their nature, VWs offer an opportunity to exploit the participant's sense of immersion and also their sense of shared experience with other individuals. VWs' nature offers a chance to exploit an individual's feeling of shared experiences and immersion with other participants (Boellstorff, 2008). Both immersion and co-presence have been identified as important facilitators of user engagement in a time when media consumers demand more and deeper experiences (Boellstorff, 2008). This engagement is achieved through artefacts exploiting "the fluid boundaries between mechanism and flesh" (Turkle, 2000, p. 555). Immersion is a key element to facilitate activity engagement in a VW environment. Immersion has been described as "the subjective impression that one is participating in a comprehensive, realistic experience" (Dede, 2009, p. 66), and it is a necessary condition to establish presence: "a state of consciousness, the (psychological) sense of being in the virtual environment" (Franceschi, Lee, & Hinds, 2008, p. 80).

Furthermore, connectivity, interactivity, and access are three critical elements for engagement to occur in the learning process, and those are precisely the pivotal components of the Second Life environment (Jarmon, 2009). Additionally, according to Jarmon (2009) the Second Life environment satisfies different needs, namely: allows the learner to access information about the virtual environment and user-built content; enables the chance for participants to collaborate; and augments student commitment through communal experience. In the present study, Second Life satisfied those requirements which resulted in students' enhanced learning. Interactivity was reflected in the Second Life environment enabling participants' communication with other residents and their capability to manipulate elements within the platform itself. Connectivity was the ability that Second Life participants had to link and associate with other in-world users to explore and learn about new places in the Second Life environment. Closely related to connectivity was the fact that students had access to wide content variety to be explored by using the Second Life platform. The abovementioned Second Life features and teacher's actions and ways of conducting the sessions in the VW promoted engagement not only to work cooperatively in the Second Life environment but also to get more interested in the topics being dealt with. It resulted in students' increased enthusiasm to explore the in-world islands and interact with other Second Life residents.

The development of students' intellectual capabilities was another positive effect of the teacher. This was associated with her teaching within the Zone of Proximal Development (Vygotsky, 1978). One appropriate way to keep students engaged is to make sure that the participants' prior knowledge is considered (Pritchard, 2009). This can be done by

adjusting the difficulty level and making sure that the lessons are planned within the ZPD. From a social constructivist perspective, interaction with others and the use of language are key elements in the cognitive development process (Pritchard, 2009). Further, that dialogic interactions do not necessarily have to be with a more educated person, but conversations with peers are also valuable (Pritchard, 2009). It is through dialogue that both individuals and groups develop new knowledge, ideas and involvement in common topics (Pritchard, 2009). The role of the more knowledgeable other is to stimulate dialogue and maintain its momentum. This “other” can come in many forms such as the form of an avatar, as it was in this case. According to Pritchard (2009) the exchange of ideas, points of view, and opinions that take place during a conversation result in a better content grasp and knowledge development for all of the participants.

The way in which Miss A used anchors to stimulate interest and motivation and her use of strategic scaffolding gradually guided the students to identify and select needed information to answer the questions she had posed. Additionally, there was a constant invitation for students to participate and contribute towards the dialogue that was taking place. Both strategic scaffolding and inviting student participation were relevant elements within the framework which improved participants’ learning.

The sessions were planned within the ZPD and followed some principles. First, there was consideration of the participants in the study. Even though each student is unique, being part of the same cultural tradition and educational system gave them a lot of skills and knowledge in common. Instruction can build upon those common features if it takes into account their individual speed and form of learning. Second, the general learning content was related to the students’ previous experiences. Session chats were the means through which students’ experiences and ideas were expressed. Sessions were planned so that students were active in investigating the two topics. The teacher gave direction and planned the activities to a certain extent, but she did not determine the concrete form of the results. Third, the content was related as a whole to the general themes of the Sydney Opera House and Uluru. The integration of the two topics was achieved through consistent emphasis: each session began with the teacher focusing on these two topics. She always made the connection with the students’ previous knowledge and reality for enhanced understanding of the topics as it was explained in the case of Mr J. Fourth, motivation and interest in the content was fostered by the teacher and augmented by the Second Life environment. The excursions around the in-world islands were essential elements for doing so. Additionally, questions such as “*Can you guess what kind of building there was*

in the site where the Opera House is now?” and *“Do you know the names of the original inhabitants who populated Australia?”* triggered inquisitiveness in the students. Fifth, the tasks given to the students by the teacher were intended to guide them to get the content gist of the two topics being dealt with.

Finally, knowledge was integrated with performance as in their final representation that took the form of a play [as previously described]. These steps were based on those proposed by Davydov (1982), namely: change or production of a problem so that the general relations are clearly seen; modelling of these relations; transformation of the model relations so that the connection is clear; creation of new problems and tasks from model; control of one’s own learning action; and evaluation of the model’s sphere of application.

As suggested by Chaiklin (2003), the general understanding of the ZPD presupposes a utopian vision of the teacher assisting the learner become an expert in any subject that is included in the curriculum. According to the researcher this conception has the implicit assumption that it is possible to quicken the learning process once an individual’s ZPD has been identified and engaged through appropriate teaching (Chaiklin, 2003). However, this ideal simplified vision of the learning process is not that easy to accomplish. In relation to Chaiklin’s (2003) first assumption, *generality*, the ZPD relates to the individual’s personal development and not to the development of specific capabilities related to particular tasks. Chaiklin (2003) stated that in relation to the second assumption, *assistance*, it is important to analyse the significance of that more knowledgeable person when assisting the development and learning process rather than only focusing on the knowledge that person possesses. Vygotsky (1987) asserted that “with collaboration, direction, or some kind of help the child is always able to do more and solve more difficult tasks that [*sic*] he can independently” (p. 209). Chaiklin (2003) argued that the third assumption, *potential*, does not always relate to gratifying situations. According to Chaiklin (2003), the aim of the previous analysis is to increase awareness with respect to generally accepted explanations of the ZPD. The teacher’s impact on learning in the Second Life environment is closely related to the primary research question:

6.3.5 What are the students’ perceptions of the role of the teacher in virtual environments (Second Life) and in face-to-face contexts?

Students who participated in both types of environments expressed their positive perceptions of the role of their respective teachers in the focus groups and individual

interviews. This positive perception was based on the constant feedback, the scaffolding provided and the sense of closeness that was developed throughout the sessions. Students perceived the teacher as a knowledge mediator. In this mediation process, the teachers did not have a starring role, but were a guide on the side. Students highlighted the importance of teachers' encouragement, especially towards those shy students. Teachers constantly boosted participants' self-esteem and promoted interaction with the rest of their peers. In both types of environments, students considered the teacher as a key element in guiding their learning. They found their teachers useful in helping them establish the cooperative type of environment that was required. One of the students in the face-to-face focus group referred to it by saying:

She was so important because she helped us a lot. For example we didn't know that in the groups we had to listen to others, to the information, and to be respectful. The role of the teacher, her main role is that she/he sets the rules in the classroom or in the meeting, and then we can work on our own. So, we do our work and if she is not in the meeting we can't do our work (FG3/25-29).

This excerpt showed how the teacher emphasised the use of appropriate social skills. This was considered an important element within the groups as it has been previously explained. Additionally, it is clear from the statement that her role was considered as a pivotal figure to organise these students' learning at the beginning of the sessions, and during the learning process. Students based their opinions on the characteristics they perceived in the teacher's personality and teaching style, namely: commitment, enthusiasm, responsibility, communication, and tolerance. Their opinions are aligned with Valkanos, Papavassiliou-Alexiou and Fragoulis's (2009) claims. They claimed that teachers should have a multidimensional role with specific skills so that they are competent in what they do. It was not only the professional features that students valued in the teacher, but also the human ones, the ones that bound them together as a community. Additionally, face-to-face students perceived the teacher as a dual entity. They stated that she gave the session a structure since she proposed the session's objectives for the day, but at the same time she provided the necessary freedom for them to work at their own pace. This was reflected in this excerpt:

My perception is that she [the teacher] was structured, but at the same time we were free, in terms of...she was structured with the class itself, but then when we were doing our own work, we were, most of the time, working on our own and she was just monitoring what we were doing, and we had freedom for doing our own stuff and then she was more like a feedback provider. So, we finished and, then, shared the information and then Miss V was giving us feedback. So it was, structured to a certain extent, we had this goal to achieve, but at the same time we were free, free to work (FG2/81-86).

Participants in this research gradually became independent and in charge of their own learning, as it was explained in the case studies. Similar to face-to-face perceptions of the teacher, virtual group students viewed the teacher as a mediator. One of the students reflected:

I think that, there should be a mediator that has knowledge about the subject, because Miss A, acts like a mediator. In her role as a teacher, she was just giving us the necessary guidelines to achieve the main goal of the sessions. I think that in a project like this you need someone that guides you because if we are all there just talking and talking it would be difficult to focus on one specific objective (FG3/20-23).

Students' views of the teacher as a mediator for knowledge construction are aligned with Mathews, Andrews, and Luck's (2012) claims that within a Second Life environment, educators need to be aware of what the participants' expectations are regarding independence and direction to build their own knowledge. In this particular study, this meant that even though there was some guidance provided, it was their actions in conjunction with their peers which resulted in the construction of new knowledge. Additionally, the framework component of knowledge construction in Second Life was promoted by the use of strategic scaffolding (Hannafin et al., 1983) and the fact that all of the participants were accountable to contribute individually to achieve the groups' objective. However, adapting to a constructivist approach to learning does not happen overnight as this requires radical modifications in the strategies they develop to cope with the process. This was made clear in the focus groups when one student reflected:

Well the teacher could make, kind of, a corner stone from where to begin to study and reinforce the subject we are trying right now, because maybe all of us get in a group to study something, but we don't know how to begin...where do we start?...what do we do first?. So in that kind of situation a teacher, a mediator...comes in handy because he knows already what to do, he knows how we have to start, how we address the subject directly in the easiest way (FG1/366-370).

The use of a cooperative approach in this study gave these students the opportunity to be in control of and contribute to their learning and that of their peers. Shifting from a conductivist approach to teaching, which was experienced throughout their academic lives, to a cooperative one, resulted in the students feeling a bit daunted at the beginning. However, as sessions progressed students realised the benefits that a student-centred approach entails. In a cooperative approach the teacher is no longer the only source for information, but is now the navigator, the guide for the group of learners dealing with potentially hundreds of choices and pieces of information in a single day. This is a complex process questioning many concepts of traditional teaching (Barrett & Gelfgren, 2011). The teacher played an important role in helping these participants decide which the most

important pieces of information were; the ones that would contribute to enhancing their learning.

In summary, participants in both types of environments had similar perceptions of the role of their teachers. Interestingly in the virtual group, neither in the focus groups nor in the individual interviews did the students refer to or mention the issue of the teacher being an avatar entity. This aspect is an important one as it indicates that these participants experienced the sense of immersion in this environment to the extent of overlooking the corporality aspect of the teacher and experiencing co-presence. In addition, their teacher perceptions were influenced by the similar educational background that all of the students shared. The new power relation between them and the teacher was not as noticeable as in a traditional environment. The domination that occurs in a traditional classroom environment involves the expected power differential between teachers and pupils. This tends to result in the withdrawal of the pupil from the teacher, and a lack of engagement on the part of the pupil (Hewitt & Ebooks, 2008). The lack of domination on the part of the teachers in both groups was a decisive factor for this positive relationship to develop, which resulted in a supportive learning environment to work in. Closely related to the students' perception question is the following secondary research question:

6.3.6 Are there specific aspects of teacher guidance that students perceive as contributing to their learning of cultural knowledge and cooperative work in virtual environments, Second Life?

Different aspects of teacher guidance were highlighted by the students in both the focus groups and individual interviews. The first one was related to the quality of the interaction that was established in the sessions. According to Johnson (2007) feedback quality and quantity provided by the teacher is directly related to the promotion of interaction amongst learners. Feedback played an important role as it has been explained in the case studies. Johnson (2007) has observed that teacher and students' interactions not only have an impact in online education outcomes but also in the quality of the learning experience of the participants. This was reflected by one student in a focus group:

I think that sometimes you don't have the time, the time to physically go to different places; to come here to the university, for example. So, if you are at home, you feel comfortable, you can interact with the teacher and people, you can talk with them. I think that is good, and I think it is better when you can do that from home; that has been really good (FG3/266-269).

It is interesting to notice how this student accentuated the part about not having to physically travel to interact with others, but he mentioned that it could be done from home

while feeling “comfortable” with it. Interaction with other individuals has a strong effect on intellectual development. Further, the learning process is understood as the cognitive modification that occurs when there is a reorganisation of an individual’s pre-existent knowledge structures (King, 2008). The teacher-students interactions favoured the learning process in the virtual environment. Learning was improved thanks to the use of appropriate and timely feedback and scaffolding as explained in the case studies. Additionally, students drew attention to their perception of the teacher promoting discussion, motivating them constantly and establishing a common goal. These aspects were highly valued by all of the participating students in Second Life. Keeping the students constantly motivated was not only an effect of the Second Life environment itself, but also the way in which the teacher conducted the sessions. It was the creation and promotion of an affective environment and the use of humour which had a preponderant role as it has been previously explained. Students also commented on the teacher guiding them according to their individual pace of learning. The versatility that the teacher showed during the sessions to keep both “slow” and “fast” learners involved, motivated and at the same level was of paramount importance to improve their learning experience. Additionally, the teacher’s skill to promote the framework elements of *group processing* (Gillies, 2007); *development* (Salmon, 2011) and *verification and clarification of students’ understanding* (Roehler & Cantlon, 1997) was a decisive factor that favoured students’ perception of the teacher in Second Life.

To sum up, students identified the quality of interaction, the feedback provided, the promotion of discussion, the constant motivation, the setting of specific goals, and the attention paid to the different learning paces as motivational aspects which boosted their learning experience in the virtual environment. It was not only the characteristics of Second Life by itself which enhanced their learning experience, but the abovementioned teacher’s characteristics as the triggering elements to make their learning a more meaningful and thorough process. All of the above questions are drawn together in answering the overarching research question:

6.3.7 What difference does the use of a 3D virtual environment make to cooperative learning when teaching to Chilean pre-service teachers?

The use of a virtual environment made an important difference to learning as shown by the achievement test results and the participants’ opinions. This difference was based on the more vivid, experiential type of learning that this environment allowed the students to have. This was possible due to the immersive environment afforded by Second Life; it offered

realistic visualisations that allowed for contextualisation of the content being dealt with. This was discussed in the focus groups, one on one interviews, and case studies. As stated, all participants agreed that Second Life provided alluring elements for learning, namely, visualisation, contextualisation and immersion, all of them having an important role, as explained. These elements contributed to the development of the novelty factor which was an engaging element as well.

The principles of learning by exploring and collaborating (Lim, 2009) were critical elements in the students' learning process. *Learning by exploring* comprised the core element that students encountered in their in-world excursions, as it has been described in the case studies. Additionally, *learning by collaborating* was also the basic foundation on which learning about Australia was based. The construction of knowledge based on in-world students' interactions through the chat tool, and working in groups to meet the objectives of the day's session enhanced the learning process. Lim's principles were coupled with the use of a cooperative approach which was also an enticing element that triggered enthusiasm in the students, as it has been explained.

The increased level of co-presence in the students was equally important. Co-presence in the virtual environment made a crucial difference to content learning as this can be looked at from the perspective of the embodiment experience that students had. The use of remote distance, electronic proximity and hypervirtual teleco-presence (Zhao, 2003) augmented the immersive reality which promoted efficient learning. The teacher presence also played an important role within the Second Life learning experience and environment; her work in-world was also an enticing element that triggered enthusiasm in the students as it has been previously discussed.

In summary, the built-in characteristics of the Second Life environment, paired with the inclusion of a cooperative approach to learning and with the guidance of the virtual teacher, created the ideal learning environment for students to feel the proximity of, and immersion in, the topics being dealt with. This resulted in favourable participants' perception and acceptance of both a virtual environment for learning and cooperation as well. Students in the focus groups perceived and talked about the value of using cooperation and virtual reality to improve their learning. This was also favoured by the permanent use of Salmon's (2011) five-stage model, the elements of structured cooperative group work (Gillies, 2007), Hannafin, Land and Oliver's (1983) and Roehler and Cantlon's (1997) scaffolding components. The figure of the teacher was highly valued

as well. Her guidance, constant scaffolding, and the creation of an affective environment, allowed participants to construct their own knowledge, decentralising the teacher's role. This culminated in an enjoyable learning process as it has been reflected by the participants in this study.

6.4 Cooperation implementation issues in the face-to-face and virtual environments

Notwithstanding the benefits of using cooperation in a classroom setting, its implementation sometimes brings surprisingly disapproving reactions from students. According to Huber and Huber (2008), under this new paradigm students question the reasons why the teacher does not continue to provide them with the syllabus contents, but instead asks students to determine cooperatively with peers what these contents should be. Similar initial reactions happened in the face-to-face group. This was due to the fact that, in the Chilean educational context, students have been used to being directed by the teacher. Additionally, according to Johnson, Johnson, and Smith (1998b) students are unaccustomed to learning cooperatively with others, hence the lack of widespread use of this learning method. The researchers argue further that the students' educational and social background emphasise competition and personal work. Further, that teachers in schools assess students based on standards and foster class categorisation (Johnson, Johnson, et al., 1998b). Johnson, Johnson, and Smith (1998b) also argue that the lack of appropriate resources goes in detriment of teachers' professional development programs; educators have to independently learn how to implement and use cooperation in the classroom (Johnson, Johnson, et al., 1998b). Finally, the authors also claim that it is the students themselves who may oppose to the introduction and implementation of new learning methods insisting on being lectured (Johnson, Johnson, et al., 1998b). Further, that when first experiencing cooperation some students may claim "I paid to hear you, not my classmates" (Johnson, Johnson, et al., 1998b, p. 28). According to Huber and Huber (2008) students' negative reactions to the use of cooperation may shock teachers since the underlying belief is that learning tasks promoting cognitive disagreement inherently motivate and engage students. Further, that these activities trigger in the students a process of inquiry to answers, doubts about themselves and their environment (Huber & Huber, 2008).

Equally important is the weight given to *thinking about thinking* in literate societies (Olson, 1994, 2005). The Chilean society is pre-eminently *oral* rather than *literate* (Morande, 1984). Consequently, there is lack of treating mind or language as objects to be further

analysed since there is no “going meta” in oral societies (Bruner, 1996). The deficit in the use of metacognition in the teaching process may be the result of the predominant cultural patterns, as in the use of the Chilean adult-run model of instruction (Preiss, 2009). Therefore, the use of metacognitive abilities to monitor and reflect on their own learning posed an initial issue for these students, as cooperation requires these skills to be used as part of the group processing stage; it implied decentralising the learning process from the teacher’s utter guidance.

Initial concerns about the use of cooperation were also experienced by the face-to-face and virtual teacher about the use of cooperation in their respective environments. This was due to the fact that in spite of the well-recognised benefits of cooperative learning, the difficulty for students to embrace it may be affected by teachers not having a clear understanding of how to implement it in the classroom (Cohen, 1994). Further, according to Gillies, Ashman, and Terwel (2008), one of the difficulties to apply cooperation in classroom settings is the lack of understanding of how to transform the underlying theories of cooperation into concrete classroom tasks. The establishment of cooperation in classroom settings involves the inclusion of cooperative practices in the syllabus, its actual implementation, supervision, and assessment (Gillies et al., 2008). Additionally, it is necessary for teachers to know how to establish, promote, and maintain group work, how to hold groups, make individuals responsible for being on task, and how to intervene when problems occur (Lotan, 2004). To overcome this situation the teachers went through a series of workshops as previously explained.

Similarly, the virtual group also experienced some initial concerns with cooperative work. However, they were more related to technical issues. In spite of Second Life providing virtual participants with a sense of immersion and “being there”, there were some software-related aspects which prevented participants in that group from receiving the full benefits of cooperative work. Initially, there was a sense of puzzlement and difficulty. This meant that it took participants some time to get used to the interface usability and the *modus operandi* of what working in Second Life entails. This is not an unusual situation as novice participants in Second Life may experience some discomfort at the beginning which is related to interface aspects and the potentially threatening features that Second Life has (Carr, Oliver, & Burn, 2010). In broader terms, computer or technical concerns may have an effect on students’ anxiety within the virtual environment (Grant et al., 2013). Additionally, it has also been claimed that the integration of technology in the educational field has contributed to augment students’ feelings of computer anxiety (Grant et al.,

2013). This caused the initial in-world sessions to be a bit chaotic until both the teacher and students themselves settled in and became familiar with this type of environment.

Students' initial reluctance to work in groups was another issue related to the implementation of cooperation in both types of environments. Baines, Blatchford, and Kutnick (2008) have claimed that students tend to react negatively when asked to work in groups; they withdraw from participating and feel threatened. Further, that students tend to look for the teacher's approval to confirm that their responses are valid (Baines et al., 2008). This related to the initial attitudes shown by some members of both groups who constantly looked for the teachers' approval. However, and as sessions progressed, participants in both groups felt empowered of their own capacities to learn in the company of their peers, showing their newly acquired independence without relying on the permanent teachers' approval.

6.5 Contribution of the present study

The present study shed light on the different aspects that contribute to increasing the body of knowledge on using a cooperative approach to learn and teach in virtual and face-to-face environments. This is not only within the Chilean context, as this study also proposes a methodological framework that can be used for implementing cooperation in virtual environments in a more global context. The first aspect that this study contributes to is related to exploring pre-service teachers' perceptions of cooperative learning, depending on the type of environment in which cooperation was established. As it was shown by the questionnaire analyses, cooperation developed similarly regardless of whether learning about a new country happened in a face-to-face or in a virtual environment.

Additionally, this study also explored participants' perceptions of the teachers and their role in guiding learning in those two types of environments, as explained in the case studies. As indicated by Billingsley and Scheuermann (2014) there is insufficient research that explores the benefits of using virtual environments in pre-service teachers' programs. Further, Kupczynski, Mundy and Maxwell (2012a) have recommended that more research is necessary to explore students' perceptions of collaborative learning in online and virtual contexts. In addition, Razmerita and Kirchner (2015) indicated that not many studies have focused on how technology favours the efficient implementation of cooperation in classroom contexts. The second aspect this study explored is related to the necessity to probe how these types of experiences contributed to their professional development and their decision to include this newly acquired knowledge in their future teaching practices.

As previously stated by Gregory et al. (2011) pre-service teachers start practicing without having the necessary tools to manage unanticipated teaching conditions. The present study shed light on the benefits of complementing and improving pre-service teachers' preparation through expanding their knowledge and successful utilisation of the cooperative approach in both virtual and face-to-face environments. Through these experiences, these pre-service teachers were given the necessary tools to, in turn, implement co-operative approaches to learning in their own classrooms. Based on these findings, it is anticipated that by providing Chilean pre-service teachers with similar experiences, they will also utilise this approach, thereby contributing to the overall improvement of the quality of education in this country. It has been argued that "it is becoming increasingly clear that teacher training institutions must begin to incorporate into their curriculum both the theoretical underpinnings of cooperative learning as well as the specific pedagogic skills necessary for its implementation in the classroom" (Courtney, Courtney, & Nicholson, 1992, p. 3). As described in the case studies, both the face-to-face and the virtual environment participants developed highly favourable perceptions of cooperation and their teachers. Further, study results suggest that it is possible to improve a learning experience by enabling students to experience a sense of immersion and first-hand education by using the affordances of Second Life. The application of this kind of setting in a school context may result in greater equity and quality of students' learning outcomes.

Therefore, improving pre-service teachers' training with updated methodologies and technological tools (Second Life) may contribute to boost teachers' evaluation results and, consequently, the quality of teaching. The use of virtual technology and the cooperative approach are very likely to trigger important changes in Chilean educational practices. This is, undoubtedly, a contribution to overcome non-appealing, teacher-centred approaches for learning within the pre-service curricula.

The discussion chapter presented the face-to-face and virtual groups' perceptions of cooperative work. It also covered the research questions that this study sought to answer based on both the qualitative information obtained from interviews and focus groups and quantitative information obtained through the use of the Cooperative Learning Questionnaire and the achievement test results. Based on this information, a framework has been proposed that could assist when establishing cooperative learning in virtual contexts (See Figure 6.1).

7. Conclusion

This study explored Chilean pre-service English teachers' perceptions of the use of cooperative learning groups to learn about Australian historical events and geographical information in a face-to-face context and the 3D VE of Second Life. The research was underpinned by social-constructivism (Vygotsky, 1978), social interdependence theory (Johnson & Johnson, 1989), the theory of cognitive development (Piaget, 1952), and connectivism (Siemens, 2004). It made use of a case study approach with multiple sub-units of analysis, more specifically an embedded design (Yin, 2009). Results of this study suggested that Chilean pre-service English teachers developed a positive perception of cooperative group work regardless of the environment in which it was implemented. This final chapter presents the conclusions drawn from this study, followed by a description of the limitations of it. Finally, future research directions are recommended.

This study contributes to the literature regarding pre-service teachers' perceptions of cooperative group work by analysing the cases of Mr J and Mr R and their respective teachers, Miss A and Miss V. The explanation of how these pre-service teachers were gradually introduced to cooperative group work and their positive perception in the use of this approach, suggests that cooperation is an effective method to enhance learning despite the context in which it is implemented. This study supplied data that contributed to understanding pre-service teachers' perceptions of cooperation and how effective this approach is for learning. Since it has been observed by Kupczynski, Mundy and Maxwell (2012a) that cooperation in online settings has not been fully analysed, this research aimed at explaining how a cooperative approach for learning contributed to improve learning in Second Life. Further, Razmerita and Kirchner (2015) have contended that it is important to understand students' perceptions of cooperation and how this is supported by technology. This research shed light on how cooperation was established within the Second Life environment for its effective use in educational contexts. Additionally, from the teachers' point of view, both Miss A and Miss V acknowledged that cooperation is a valuable method to improve student-centred group work and the establishment of a better learning environment. In both types of environments, cooperation contributed to improve group work, a fact that is aligned with Johnson and Johnson's (2003c) views on how cooperation improves the achievement of group goals. The qualitative data presented here suggested that the use of a cooperative approach to learning and teaching was positively experienced by these Chilean pre-service teachers. The use of a social constructivist

approach to learning showed to be an effective approach to boost not only these participants' learning but also their development of social skills for group work.

The data also implied that the extent to which both case study subjects improved their learning outcomes and relationships with their respective teacher was possible due to the establishment of the cooperative environment. Similarly, both teachers realised that a cooperative paradigm improved their teaching practices, making it possible to shift from a teacher-centred to a student-centred approach. The use of a constructivist approach to learning resulted in a change of focus, with students having active learning roles and assuming responsibilities for their own knowledge construction. Within this paradigm, the teachers played the role of facilitators and guides – not being the sole providers of information, but guiding and scaffolding the learning process so that students were able to construct new knowledge in the company of their peers. As found in the case studies, both teachers embraced the use of cooperation for teaching as they realised that its use increased students' achievements, the development of social skills and a sense of community.

In the case of Mr J and his peers, learning cooperatively in the virtual environment of Second Life augmented their sense of immersion and “lived experiences” which enhanced their engagement and the learning experience as a whole. Additionally, the use of the community of inquiry framework with its three presences (social, cognitive, and teaching) helped support improved learning outcomes through cooperation. This ensured that the educational experience in this type of environment was smooth and balanced, being highly beneficial in terms of content gain and social development for the group participants. Second Life facilitated Mr J and his peers' learning process through visualisations which helped create a sense of presence in this environment. Further, cooperation was enhanced by the constant and interwoven use of the elements of the proposed framework, which included Salmon's (2011) five-stage model, structured cooperative group elements (Gillies, 2007), and Hannafin, Land and Oliver (1983) and Roehler and Cantlon's (1997) scaffolding components. The intertwinement of these elements facilitated that participants were not only smoothly getting into online work, but also that cooperation was introduced gradually in conjunction with the continuous use of scaffolding elements. In addition, the fact that Second Life appealed to different learning styles in the virtual participants enabled the possibility to make learning more meaningful and comprehensive for them. This element was highly motivational for it was the first time they used a virtual reality setting for educational purposes.

Similarly, Mr R and his peers also benefited from the use of a cooperative approach in the face-to-face context by establishing productive social networks for knowledge construction and learning. The improvement in Mr R's inter-relationships with the rest of the group and his social unfolding was an added benefit. Cooperation helped him and his peers to establish robust working relationships. Further, the new relationships established by Mr R and his classmates helped them develop more advanced cognitive processes, namely: contrasting, comparing, speculating, and inferencing. Their use facilitated the establishment of new connections between novel material and the participants' previous knowledge which was a key element for learners to engage more deeply in complex learning tasks.

In addition, both teachers also experienced the benefits that teaching under a cooperative model can entail. Miss A recognised that she developed closer relationships with her students than she had ever done before; this was due to the cooperative model being used which resulted in more relaxed sessions. The use of the Second Life environment also contributed to this occurring by lowering inhibition and anxiety in the participants. On the other hand, Miss V acknowledged learning together with the students, realising that there were certain practices that she was not aware of. As explained in the case study, Miss V's understanding of cooperative group work derived from her training as an English teacher. However, and after the induction sessions she attended, she was aware of the different elements that are necessary to establish structured cooperative group work in the classroom. Deepening her understanding of cooperation made her feel rewarded and certain that she would use cooperation in her teaching practices to make students even more active in class. In both cases the paradigm shift resulted in the teachers being more active and dynamic within their respective environments as they had to provide opportune feedback and scaffolding when necessary. This required important changes in these two teachers' ideas about teaching and learning, something which contributed to their professional development and teaching practices. Both teachers acknowledged the benefits of working under a cooperative approach to learning and the benefits its use entails that are reflected in the development of self-confidence, use of appropriate social skills, cognitive abilities, and the establishment of a healthy psychological setting (Johnson et al., 1991). Equally important was teacher presence for learning in both groups. Regardless of the type of environment the teacher was a necessary figure in guiding the learning process as stated by both groups' participants. The teachers' use of timely scaffolding, feedback and the establishment of a sense of community, contributed to

develop emotional links which resulted in positive interdependence. This was repeatedly commented on in the case studies and focus groups.

Together with teacher presence, the use of scaffolding in both types of environments was an important element which supported learning. In Second Life, scaffolding allowed the participants to explore and make use of this virtual environment in the best possible way to learn about Australia. Similarly, in the face-to-face group opportune scaffolding promoted reflection and the exchange of opinions that promoted active and participatory learning. Further, the feedback used in both types of environments facilitated to reduce “the gap” “the distance between where the student ‘is’ and where he or she is ‘meant to be’” (William, 2011, p. 122). In addition to the use of scaffolding, feedback proved to be beneficial and appreciated by these participants as they were able to determine what aspects had to be reflected on and improved. For the teachers, providing feedback was a useful means to timely restructure understandings and to confirm that participants were on the right track to meet the goals and objectives of each session.

This study’s results suggest that social-mediated learning is an effective way to facilitate the learning process especially when the existing context has historically been based on a teacher-centred approach as it has been the case of Chile. The findings in this study accord with Vygotskian theory in the sense that learning and cognitive development are socially enacted processes (Vygotsky, 1978). Further, working in the company of others helps participants voice their opinions as well as enhance and develop their content understanding by creating the appropriate environments for these processes to happen (Kumpulainen & Wray, 2002). This happened in both types of environments, as described in the case studies, where the social interactions and dialogues took place in virtual and face-to-face facilitated learning contexts. Additionally, results also concur with Johnson and Johnson’s (1989) theory of social interdependence, which states that the promotive interactions created amongst participants is a key element to actively involve students in learning situations. In both types of environments, students were highly engaged in the different tasks they were presented with to meet the session’s objectives. This in turn helped the participants to attain multiple academic objectives while, at the same time, allowing for the students’ individual learning needs and focusing on varied social issues (Johnson, 1999). This study also accords with connectivist claims which state that “personal knowledge is comprised of a network, which feeds into organisations and institutions, which in turn feeds back into the network and then continues to provide learning to the individual” (Siemens, 2004, p. 5). The Second Life environment enabled

participants to engage in a continual learning process by talking to other residents and visiting the locations and in-world islands, making the learning process hands-on, active, and updated.

The statistical analyses of the quantitative data suggest that there was no significant difference between students' perceptions of cooperation regardless of the type of environment in which learning took place; neither the face-to-face nor the virtual environment participants' perceptions of cooperation were influenced by the cooperative learning sessions. However, the qualitative data suggests that the teachers and students responded positively to their experience of the use of a cooperative approach to learning and teacher presence in both types of environments. Considering that learning cooperatively in the face-to-face and Second Life environment was a new experience for them, the engagement in the tasks and motivation to participate was reflected in students' increased learning outcomes. Further, Miss A and Miss V acknowledged the contribution that teaching under a cooperative approach may have in the classroom and decided to adopt it in their practices in the future.

On the other hand, test results indicate that those students learning in the virtual environment of Second Life achieved better learning outcomes and had a better learning experience as per test results at Time 2. However, when examining within group differences, both face-to-face and virtual groups performed better at Time 2, which showed that cooperative learning is an adequate approach to increment students' learning regardless of the context in which it is used.

In summary, the qualitative and quantitative results reported in this study showed that a cooperative paradigm for learning about Australia was helpful to students. It increased students' development as social beings by contributing to their social unfolding as they became more open and receptive to working and learning with others. Further, their learning was enhanced as it was constructed in the company of others; a fact that accords with Vygotskian (1978) views of learning. Additionally, results from this study also indicate that cooperation can also be established within a virtual environment such as Second Life due to its inherent features of creating a sense of immersion, which assists establishing a sense of presence (Chau et al., 2013). It is this sense of presence and being with others, regardless of physical constraints, that contributes to work with others in groups to achieve common goals.

7.1 Limitations of the study

Although the results in this study indicated that the use of a cooperative approach for teaching and learning were helpful within the Chilean pre-service English teachers' context where it took place, caution should be exercised in the generalisation of the results to other contexts. Generalisation of this study results is not possible as this specific sample does not represent the total of Chilean pre-service population.

First, this study took the form of an embedded-case study which considered a particular sample which means that the population that formed part of this study is not representative of the totality of the Chilean context. While case studies enable the exhaustive comprehension of a particular phenomenon, the findings are limited to contextual circumstances (Yin, 2009). Therefore, results would potentially vary if this study were to be conducted within different contexts. Additionally, the participants considered in this study consisted of 39 pre-service teachers enrolled in an English program at a private university. The sample is relatively small to generalise these findings to other contexts considering that the use of a case study methodology made the study results be specific to a particular context.

Second, another limitation this study encountered was associated to the timespan within which this project took place. One academic semester may be a relatively short time for cooperation to be fully implemented and internalised by both teachers and students. Despite the positive attitudes towards implementing and using cooperation in this study, it has been observed that for new programs to be effective they have to be sustained over time, focused on the content to be taught, and provide multiple opportunities for classroom application (Darling-Hammond & Richardson, 2009). However, structured cooperation, being a novel approach in the Chilean context, teachers and participants accepted it and commented on its benefits as it was explained in both case studies.

Third, the context within which this study took place posits another limitation to the study results. Since the Chilean context has certain characteristics due to its historical background and the way in which teaching takes place there, that may have influenced the results. As mentioned earlier, the innovation that the cooperative approach represented for these participants may have influenced participants' responses to interviews and focus groups' questions. Participants adopted cooperative principles so eagerly, as a possibility for them to voice their opinions, that this may have biased their opinions and views on cooperation.

Finally, possible threats to the quality of the information contained in the interviews and focus groups may have taken place due to participants' bias, since each person has certain and unique characteristics that may influence their points of view. Each person's perception of a situation is unique and that perception may be biased by many factors (Coolican, 1990). Coolican also observed that each person's perception of a specific situation is different and that difference may be influenced by different extrinsic elements. It is the different ways in which people construct knowledge, their own previous experiences, which may result in totally different attitudes towards a specific phenomenon. This was the reason why multiple data sources were used to improve this study objectivity including one on one teachers and participants' interviews as well as focus groups and quantitative data.

7.2 Future research directions

Considering the limited number of participants in this study, further investigation could involve a larger sample to explore whether the establishment of cooperation in a virtual environment yields similar results. Additionally, it would be interesting to look at a more varied population and determine whether the type of major they are enrolled in and their social background influences the study results.

Equally interesting could be the use of the proposed framework elements used in this study in a real context and for a longer period of time. The use of Salmon's (2011) five-stage model, structured cooperative group elements (Gillies, 2007), and Hannafin, Land and Oliver (1983) and Roehler and Cantlon's (1997) scaffolding components demonstrated to be useful to enhance cooperation in the virtual environment of Second Life. As mentioned, the simultaneous use of the framework components provided the necessary elements for cooperation to develop in Second Life. The successive and gradual advance from the initial stages in the framework elements to the most advanced ones, contributed to the establishment of a sense of group work within the virtual environment. However, and based on the reduced sample considered in this study, further research is necessary to determine whether that framework may yield similar expected results in other contexts. Additional exploration and validation of this framework and its use in different contexts would help to improve the establishment of cooperative group work in technology mediated learning spaces.

Finally, this study made use of an already created environment in Second Life (Australia) for the sake of the timeframe within which this study had to take place. It would be

interesting to explore whether a custom made in-world environment in Second Life, created specifically to meet the course needs, produces better results when used in conjunction with the framework that was used in this study. Considering that the use of a pre-existing environment, not specifically created for the purposes of this study, produced positive learning outcomes, it is expected that a tailored in-world setting used in conjunction with the framework would generate more positive learning results.

Results obtained from this study suggest that cooperation is a beneficial learning approach that it is positively perceived by learners regardless of the environment in which it is used. Further, it is an approach that contributes not only to learning development but also to promote personal skills that may be utilised in different life contexts, as it was explained in one of the case studies. In contexts where the use of a teacher-centred approach has been extensively used, cooperation is positively perceived as it demonstrated to trigger and promote personal and academic change.

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Appendices

Appendix 1: Cooperative Learning Questionnaire – Face-to-face environment

Cooperative Learning Questionnaire: Students' perceptions of how the group worked in a face-to-face environment

Name: _____

Date: _____

Each of the questions will ask you about how the group worked. Next to each question there is a number. Circle your answer.

Circle number 1 if this almost never happened

Circle number 2 if this seldom happened

Circle number 3 if this sometimes happened

Circle number 4 if this often happened

Circle number 5 if this almost always happened

1.) All the group members felt free to talk. *

1 2 3 4 5

almost never happened	()	()	()	()	()	almost always happened
-----------------------	-----	-----	-----	-----	-----	------------------------

2.) There was interrupting or cutting off. *

1 2 3 4 5

almost never happened	()	()	()	()	()	almost always happened
-----------------------	-----	-----	-----	-----	-----	------------------------

3.) People listened to one another. *

1 2 3 4 5

almost never happened	()	()	()	()	()	almost always happened
-----------------------	-----	-----	-----	-----	-----	------------------------

4.) Group members were asked to expand on a point they were trying to make. *

1 2 3 4 5

almost never happened	()	()	()	()	()	almost always happened
-----------------------	-----	-----	-----	-----	-----	------------------------

5.) Members had opportunities to share their ideas. *

1 2 3 4 5

almost never happened	()	()	()	()	()	almost always happened
-----------------------	-----	-----	-----	-----	-----	------------------------

6.) Some members dominated. *

1 2 3 4 5

almost never happened	()	()	()	()	()	almost always happened
-----------------------	-----	-----	-----	-----	-----	------------------------

7.) Group members were sensitive to the needs and concerns of other group members. *

	1	2	3	4	5	
almost never happened	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	almost always happened

8.) Group members considered a number of ideas before coming to a decision. *

	1	2	3	4	5	
almost never happened	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	almost always happened

9.) Everyone agreed to the decisions that were made. *

	1	2	3	4	5	
almost never happened	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	almost always happened

10.) There was some organization in the group (e.g., each member had a job to do). *

	1	2	3	4	5	
almost never happened	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	almost always happened

11.) I have formed friendships from doing group work. *

	1	2	3	4	5	
almost never happened	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	almost always happened

12.) Other group members have been helpful to me. *

	1	2	3	4	5	
almost never happened	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	almost always happened

13.) The members worked well together as a group. *

	1	2	3	4	5	
almost never happened	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	almost always happened

14.) I felt OK about being in the group. *

1 2 3 4 5

almost never happened	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	almost always happened
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	------------------------

18.) Students behaved well when working in the group. *

1 2 3 4 5

almost never happened	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	almost always happened
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	------------------------

15.) Members helped each other in the group. *

1 2 3 4 5

almost never happened	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	almost always happened
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	------------------------

16.) Members acted responsibly when working in the group. *

1 2 3 4 5

almost never happened	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	almost always happened
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	------------------------

17.) Students like to take responsibility when working in groups. *

1 2 3 4 5

almost never happened	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	almost always happened
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	------------------------

19.) The group set their own behaviour rules. *

1 2 3 4 5

almost never happened	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	almost always happened
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	------------------------

20.) Members in the group spoke politely to others. *

1 2 3 4 5

almost never happened	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	almost always happened
-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	-----------------------	------------------------

Appendix 2: Cooperative Learning Questionnaire – Virtual environment

Cooperative Learning Questionnaire: Students' perceptions of how the group worked in the virtual environment of Second Life

Name: _____

Date: _____

Each of the questions will ask you about how the group worked in the Second Life environment.

Next to each question there is a number. Circle your answer

Circle number 1 if this almost never happened

Circle number 2 if this seldom happened

Circle number 3 if this sometimes happened

Circle number 4 if this often happened

Circle number 5 if this almost always happened

1) All the group members felt free to interact in-world.

1 2 3 4 5

2) There was interrupting or cutting off by other avatars.

1 2 3 4 5

3) People paid attention to one another when interacting in-world.

1 2 3 4 5

4) Group members were asked to expand on a point they were trying to make by the avatar teacher.

1 2 3 4 5

5) Members had opportunities to share their ideas when in-world.

1 2 3 4 5

6) Some avatar members dominated the in-world interaction.

1 2 3 4 5

7) Avatar group members were sensitive to the needs and concerns of other avatar members when interacting virtually.

1 2 3 4 5

8) Avatar group members considered a number of ideas before coming to a decision.

1 2 3 4 5

- 9) All avatars agreed to the decisions that were made in-world.
1 2 3 4 5
- 10) There was some organization in the virtual group (e.g., each member had a job to do).
1 2 3 4 5
- 11) I have formed friendships from doing group work with other avatars.
1 2 3 4 5
- 12) Other avatar group members have been helpful to me when in-world.
1 2 3 4 5
- 13) The avatar members worked well together as a virtual group.
1 2 3 4 5
- 14) I felt OK about being in the virtual group.
1 2 3 4 5
- 15) Avatar members helped each other in the virtual group.
1 2 3 4 5
- 16) Avatar members acted responsibly when working in the virtual group.
1 2 3 4 5
- 17) Avatars like to take responsibility when working in virtual groups.
1 2 3 4 5
- 18) Avatars behaved well when working in the virtual group.
1 2 3 4 5
- 19) The virtual group set their own behavior rules.
1 2 3 4 5
- 20) Avatar members in the group interacted politely to others.
1 2 3 4 5

Appendix 3: Achievement Test

Achievement test

Name: _____

Date: _____

I. The first part of this test is aimed at assessing how much you know about the Sydney Opera House and the circumstances under which it was built. Read the statement and circle the correct alternative.

1) The Opera House was started to be built in

- a) 2010.
- b) 1959.
- c) 1957.
- d) 1945.

2) The architect who designed the Opera House was

- a) Julia Gillard.
- b) Jørn Utzon.
- c) Louis Kahn.
- d) Kevin Rudd.

3) Which event happened in the year 1966 that is related to the Opera House?

- a) Its designer quit.
- b) It was opened to the public.
- c) It was closed for renovations.
- d) The project depleted its funds.

4) What has the Opera House earned?

- a) A world-class performing arts reputation.
- b) Its place as a wonder of the ancient world.
- c) A radical alteration.
- d) A lot of money due to its contemporary architecture.

5) How long did the construction of the Opera House take?

- a) 16 years.
- b) 10 years.
- c) 15 years.
- d) 13 years.

6) When was the Opera House opened?

- a) 1966.
- b) 1973.
- c) 1999.
- d) 1945.

7) The Opera House was opened by

- a) Queen Elizabeth II.
- b) Kevin Rudd.
- c) Lady Diana.
- d) Prince Charles.

8) The Opera House is for the Australian people

- a) A source of pride.
- b) A reminder of the aboriginal people.
- c) A source of shame because of the "stolen generation".
- d) A reminder of Captain Cook's arrival in Australia.

9) Under which circumstances did the Opera House building come to be?

- a) The NSW Government called an international design competition and the winner proposed that design.
- b) People from Australia gathered money and got the inspiration from the waves.
- c) The Queen gave the money for its construction.
- d) The Australian Prime Minister asked for its construction and provided the funds.

10) It took over three years, in the building of the Opera House

- a) To decorate it.
- b) To develop the special ceramic tiles for the shells.
- c) To clean all of the windows that compose the Opera House.
- d) To gather the funds and cement to build it.

11) According to UNESCO, the Opera House is

- a) A great architectural work of the 20th century.
- b) A source of money expenditure for the Australian government.
- c) The origin of disputes between Australian and aboriginal people.
- d) Better built than the Pyramids of Egypt.

12) What role does composer Eugene Goossens play in the Opera House?

- a) He wrote the song to which the opera house was opened to.
- b) He provided part of the funds for the construction.
- c) He drew attention to the need of an opera house.
- d) He designed it.

13) What is an anecdote related to the Opera House project?

- a) The design was objected because aboriginal people did not like it.
- b) The winning design was rescued from a pile of discarded submissions.
- c) They ran out of funds which were later gathered by busking in the streets.
- d) Aboriginals built it for free.

14) In the building of the Opera House, it took eight years

- a) To gather the funds for its construction.
- b) To clean the space where the basis were going to be.
- c) To solve the design and construction of the shell structure.
- d) To paint it.

- 15) "Bennelong" is related to the Opera House because**
- a) His hut stood where the Opera House is now located.
 - b) He developed the plans for the construction of the Opera House.
 - c) It is the aboriginal name for the Opera House.
 - d) It is the name of the special material with which the Opera House is built.
- 16) In the year 1972**
- a) The Opera house project was completed.
 - b) There was a test performance in the concert hall.
 - c) The Opera House was visited by the Queen.
 - d) There was a public protest against the project.
- 17) The whole cost of the Opera House project was approximately**
- a) 600 millions.
 - b) 102 millions.
 - c) 50 millions.
 - d) 90 millions.
- 18) How many stages did the Opera House construction comprise?**
- a) 3 stages.
 - b) 4 stages.
 - c) 2 stages.
 - d) 5 stages.
- 19) When did guided tours begin in the Opera House?**
- a) In 1973.
 - b) In 1970.
 - c) In 1990.
 - d) In 1975.
- 20) When was the Grand Organ which is in the Opera House inaugurated?**
- a) In 1979.
 - b) In 1973.
 - c) In 1966.
 - d) In 1970.

II. The second part of this test is aimed at assessing how much you know about “Uluru” and its importance for Australian people. Read the statement and circle the correct alternative.

1) What happened in the year 1936?

- a) Uluru was discovered.
- b) Uluru was opened to the public.
- c) Uluru was declared aboriginal reserve.
- d) Uluru was closed to the public.

2) What does the word “Uluru” mean?

- a) It has no particular meaning.
- b) It means “sacred rock”.
- c) It means “red mountain”.
- d) It means “desert”.

3) What aboriginal culture is related to “Uluru”?

- a) Anangu culture.
- b) Kata Tjuta.
- c) Uluru culture.
- d) Australian culture.

4) What is the “Mulgara”?

- a) A type of plant.
- b) A mammal that lives near Uluru.
- c) A type of amphibian.
- d) The name for the local people.

5) How many mammal species have been introduced in the park where “Uluru” is located?

- a) Six species.
- b) Twenty-seven species.
- c) Seventy-three species.
- d) Three species.

6) How many deaths have been related to climbing Uluru from the time they started to be recorded?

- a) At least 35.
- b) At least 45.
- c) At least 50.
- d) At least 10.

7) Today, how many visitors does the Uluru park have?

- a) Nearly 400.000 visitors.
- b) Nearly 100.000 visitors.
- c) Nearly 1 million visitors.
- d) Nearly 300.000 visitors.

8) What has happened to the fauna surrounding Uluru?

- a) It has decreased.
- b) It has doubled.
- c) It has disappeared.
- d) It has tripled.

9) How many species of mammals have, historically, lived near Uluru?

- a) 23 species.
- b) 46 species.
- c) 13 species.
- d) 20 species.

10) What happened in the year 1873?

- a) Gosse is the first European to visit Uluru.
- b) Uluru emerged from underneath the earth.
- c) There was an earthquake that unearthed Uluru.
- d) Uluru was first viewed by European settlers.

11) What is “Tjukurpa”?

- a) A kind of extinct animal in the area.
- b) The aboriginal name for “water”.
- c) It constitutes the religion, law and moral systems of the Anangu society.
- d) The name for Uluru in the local language.

12) How high is Uluru?

- a) 400 meters.
- b) 348 meters.
- c) 3.6 kilometers.
- d) 9.4 kilometers.

13) Geologically speaking Uluru is an “inselberg” which literally means

- a) Solid rock.
- b) Island mountain.
- c) New rock.
- d) Basalt rock.

14) Nowadays, the local people are employed doing

- a) Tours informing visitors.
- b) Cleaning of the tourist attractions.
- c) Representations of ancient rituals.
- d) Nothing since they are unemployed.

15) How many bats species does Uluru comprise?

- a) At least five species.
- b) At least seven species.
- c) At least six species.
- d) No species since they have all disappeared.

16) How long ago did humans settle in the area where Uluru is?

- a) 1 million years ago.
- b) 5 thousand years ago.
- c) one thousand years ago.
- d) two-hundred years ago.

17) What part do ceremonies play in the passing on of knowledge for the local people?

- a) They are not important since knowledge is kept written.
- b) They play a very important role since knowledge must be passed on to the right people.
- c) They are somewhat important and often performed.
- d) They are definitely not an important activity.

18) With the arrival of Europeans, the Anangu people

- a) Easily adopted the new traditions and culture.
- b) Became friends with the newcomers.
- c) Resisted assimilation and left missions and government settlements.
- d) Escaped to other areas.

19) What happened in 1973 related to the park?

- a) Parliament recommended that tourist accommodation should be relocated.
- b) The park was closed for renovations.
- c) New mammal species were introduced.
- d) The Anangu people started fighting for their rights.

20) What happened in 1983 related to the park?

- a) The title of Uluru National Park was granted to the traditional owners.
- b) Bat species definitely disappeared.
- c) The Queen visited the area.
- d) An earthquake damaged the area badly.

Appendix 4: Lesson plan for teachers

Sessions for teachers

All of the sessions that will take place for students to learn about the Sydney Opera House and “Uluru” are under the Cooperative Learning approach in which all students are responsible not only for their own learning but also for that of their classmates. The face-to-face group work will be organized under the structured group paradigm proposed by Deutsch (1949) containing the five essential elements of effective cooperation namely positive interdependence, individual accountability, promotive interaction, appropriate use of social skills and group processing. The virtual group will be structured under the 5 stage paradigm proposed by Salmon for online learning (2011) including the elements of access and motivation, online socialization, information exchange, knowledge construction, and development.

By the end of the process, students will have to present to their classmates on their findings and produce some product (both in-world and face-to-face).

Topic 1: Sydney Opera House

Session number 1 (Face-to-face)

Time: 40 minutes

Method: cooperative

Type of activity: face-to-face (1st lesson)

Objective: To get understanding of the aboriginal people who inhabited the area and their relation to the Opera House site.

Warm up:

The teacher brainstorms ideas to elicit on students previous knowledge about the people who inhabited the site/area where the Opera House is. Teacher may ask questions like the following to foster dialogue among students:

- Do you know the names of the original inhabitants who populated Australia?
- Can you guess/ Do you know what kind of building/structure there was in the site/area where the Opera House is now?
- How was the relationship between the aboriginal people and the first European settlers like? Do you think?

In this session, students work/look for information to get understanding of how the settling process was like. What kind of situations the European settlers had to face and the like. Students are encouraged to dialogue and share the information they have found based on the specific roles they have decided on. The teacher is constantly providing feedback, monitoring and overseeing the whole process. The teacher asks the students to get in groups of 4. They will choose who they work with.

Activities:

- Students decide on the different roles that each member will play in the group.
- Students work in their groups looking for information.
- Each student looks for specific information related to the role he or she decided to play in the group.
- Students discuss / exchange opinions on the information they found.
- Students are asked to socialize among their classmates the information they have found on their own as part of the self-designated role in the group.
- The teacher monitors on students' progress and gives appropriate feedback.

Session number 1 (Virtual)

Time: 40 minutes

Method: cooperative

Type of activity: Virtual (1st lesson)

Objective: To get understanding of the aboriginal people who inhabited the area and their relation to the Opera House site.

Warm up:

The teacher agrees on a time to meet with the students virtually (they can meet at the University of Queensland Island, UQ Religion Bazaar) and starts chatting/ using voice chat and prepares the students by asking them questions about Australia that will elicit and activate previous knowledge they may have. Once they are there, the teacher brainstorms ideas to elicit on students previous knowledge about the people who inhabited the site/area where the Opera House is. Teacher may ask questions like the following to foster dialogue among students:

- Do you know the names of the original inhabitants who populated Australia?
- Can you guess/ do you know what kind of building/structure there was in the site/area where the Opera House is now?
- How was the relationship between the aboriginal people and the first European settlers like, do you think?

The teacher allows the students to discuss among themselves and exchange ideas related to the site, they can talk to other residents to obtain some information if they like. The teacher asks the students to wander around the building and discuss/exchange information. They look for information related to the topic of discussion either in-world or looking at websites.

Activities:

- Students work in their groups looking for information.
- Each student looks for specific information related to the role he or she decided to play in the group.
- Students fly around the building/talk to other residents to see whether they can gather some information.
- They can look for information on websites as well.
- Students discuss / exchange opinions on the information they found.

The teacher monitors on students' progress and gives appropriate feedback.

Session number 2 (Face-to-face)

Time: 40 minutes

Method: cooperative

Type of activity: face-to-face (2nd lesson)

Objective: Work in groups to find out about the historical moment in which the Sydney Opera House project was called on by the Australian government.

Warm up:

The teacher prepares the students by asking them questions about Australia that will elicit and activate previous knowledge they may have. Teacher may use questions like the following:

- What do you know about Australia?
- Where is it located?
- Are there any neighboring countries? Which ones are those?
- Do you know who the original inhabitants from that place were?
- What do you know about the European immigration?
- Can you think of any iconic building or place that is famous/well known in Australia?

The teacher allows the students to discuss among themselves and shows them pictures/slides of places in Australia to foster discussion and exchange of ideas /opinions. This brainstorming activity will allow the teacher to narrow down and foster discussion about the Sydney Opera House topic.

Activities:

- Students are allowed to look for information/split the tasks on the different web pages/books/encyclopedias.
- Students are asked to discuss/exchange opinions on the information they found.
- Throughout the activity, the teacher monitors on students' progress and gives appropriate feedback.

Session number 2 (Virtual)

Time: 40 minutes

Method: cooperative

Type of activity: Virtual (first lesson)

Objective: Students will work in groups to find out about the historical moment in which the Sydney Opera House Project was called on by the Australian government.

Warm up:

The teacher prepares the students by asking them questions about Australia that will elicit and activate previous knowledge they may have. Once they are there, the teacher elicits previous knowledge on Australia by asking questions like the following:

- What do you know about Australia?
- Where is it located?
- Which are its neighboring countries?
- Do you know who the original inhabitants from that place were?
- What do you know about the European immigration?
- Can you think of any iconic building or place that is famous/well known in Australia?

The teacher allows the students to discuss among themselves and can teletransport them to the different islands related to/with Australian motif (Australia and the places within this site ("residential", "Centrepoint tower", "harbour bridge", "the point"), The University of Western Australia. This is done to foster discussion and exchange of ideas /opinions. This brainstorming activity will allow the teacher to narrow down and foster discussion about the Sydney Opera House topic.

Teacher asks the students to get in groups of 4. They will choose who they work with.

Activities:

- Students get in groups of 4 in-world.
- Students decide on the different roles that each member will play in the group.
- Students are allowed to teletransport and explore on their own the different areas related to Australia in Second Life (as described above).
- The teacher monitors on students' progress and gives appropriate feedback.

Session number 3 (Face-to-face)

Time: 40 minutes

Method: cooperative

Type of activity: face-to-face (3rd lesson)

Objective: Work in groups to find out about how the final project and architect to build the Opera House were chosen.

Warm up:

The teacher prompts students to make them recall their previous conversation/discussion about the information related to the Opera House by asking questions like the following.

- What interesting information did you find about Australia?
- Which state in Australia was the one that called on the project?
- What was the idea to call on such a project?

The teacher allows the students to discuss among themselves and exchange ideas based on the information they previously looked for. The teacher asks the students to look for information related to the winning project and the architect who executed it.

Activities:

- Students work in their groups looking for information.
- Each student looks for specific information related to the role he or she decided to play in the group.
- Students discuss / exchange opinions on the information they found.
- The teacher monitors on students' progress and gives appropriate feedback.

Session number 3 (Virtual)

Time: 40 minutes

Method: cooperative

Type of activity: Virtual (3rd lesson)

Objective: Work in groups to find out about how the final project and architect to build the Opera House were chosen.

Warm up:

The teacher encourages in the students wandering around the building and talking to other people to obtain information. The teacher may use the following questions:

- What interesting information did you find about Australia?
- Which state in Australia was the one that called on the project?
- What was the idea to call on such a project?

The teacher allows the students to discuss among themselves and exchange ideas based on the information they previously looked for. Students can teletransport themselves to islands that are of their interest and from where they will get information or interact with other residents in-world; all of this to look for information related to the winning project and the architect who executed it.

Activities:

- Students work in their groups looking for information.
- They teletransport themselves/are teletransported by the teacher to find information.
- Students fly around the building/talk to other residents to see whether they can gather some information.
- They can look for information on websites as well.
- Students discuss / exchange opinions on the information they found.

The teacher monitors on students' progress and gives appropriate feedback.

Session number 4 (Face-to-face)

Time: 40 minutes

Method: cooperative

Type of activity: face-to-face (4th lesson)

Objective: Work in groups to find out about the events related to the construction and opening / inauguration of the Sydney Opera House.

Warm up:

The teacher prompts students to make them recall their previous conversations/discussions about the information related to the Opera House by asking questions like the following:

- What have you learned about this iconic building which is the Opera House so far?
- Do you know who inaugurated the Opera House building?
- Do you know when it was open to the public?
- Do you know if there have been any famous concerts held there?

The teacher allows the students to discuss among themselves and exchange ideas based on the information they previously looked for. The teacher asks the students to look for information related to the building and opening of the Opera House.

Activities:

- Students work in their groups looking for information.
- Each student looks for specific information related to the role he or she decided to play in the group.
- Students discuss / exchange opinions on the information they found.
- Students are asked to socialize among their classmates the information they have found on their own as part of the self-designated role in the group.
- The teacher monitors on students' progress and gives appropriate feedback.

Session number 4 (Virtual)

Time: 40 minutes

Method: cooperative

Type of activity: Virtual (4th lesson)

Objective: Work in groups to find out about the events related to the construction and opening / inauguration of the Sydney Opera House.

Warm up:

Students are prompted by the teacher to encourage conversation and discussion related to the topic in question by asking questions like the following:

- What have you learned about this iconic building which is the Opera House so far?
- Have you found any anecdotic facts about the place where the building is?
- What was there before the building itself was built?

The teacher allows the students to discuss among themselves and exchange ideas based on the information they previously looked for. The teacher asks the students to look for information related to the building and opening of the Opera House either in-world or websites.

Activities:

- Students work in their groups looking for information.
- Students discuss / exchange opinions on the information they found.
- Students are asked to socialize among their classmates the information they have found on their own as part of the self-designated role in the group.
- Students talk to other residents to find information.
- The teacher monitors on students' progress and gives appropriate feedback.

Session number 5 (Face-to-face)

Time: 40 minutes

Method: cooperative

Type of activity: face-to-face (5th lesson)

Objective: To deepen students' understanding of the events related to the construction and opening/inauguration of the Sydney Opera House.

Warm up:

The teacher prompts students to make them recall their previous exchange of information related to the Opera House by asking questions like the following based on the information they have been looking for. Teacher may ask questions like the following to foster dialogue among students:

- What reputation has the Opera House earned both in Australia and at an international level?
- Is there any specific information that has called your attention about Australia/the Opera House building? Why?
- Was there any particular aspect related to the materials with which the Opera House used its construction that called your attention? Why?
- Were there any composers related to the construction of the Opera House?

In this session students keep on working/looking for information to get a better understanding of what the whole process in the construction of the Opera House was like, all of the participants involved and related events. Students are encouraged to dialogue and share the information they have found based on the specific roles they have decided on. The teacher is constantly providing feedback, monitoring and overseeing the whole process.

Activities:

- Students work in their groups looking for information.
- Each student looks for specific information related to the role he or she decided to play in the group.
- Students discuss / exchange opinions on the information they found.
- Students are asked to socialize among their classmates the information they have found on their own as part of the self-designated role in the group.
- The teacher monitors on students' progress and gives appropriate feedback.

Session number 5 (Virtual)

Time: 40 minutes

Method: cooperative

Type of activity: virtual (5th lesson)

Objective: To deepen students' understanding of the events related to the construction and opening / inauguration of the Sydney Opera House.

Warm up:

The teacher encourages the students to have a close look at the building and ask other residents for information. Teacher may ask questions like the following to foster dialogue among students:

- What reputation has the Opera House earned both in Australia and at an international level?
- Did any anecdotic events surround the opening of the Opera House?
- How long did the construction of the Opera House take?
- Were there any composers related to the construction of the Opera House?

In this session students keep on working/looking for information to get a better understanding of what the whole process in the construction of the Opera House was like, all of the participants involved and related events. Students are encouraged to talk to residents and look for information related to the topic of discussion. The teacher is constantly providing feedback, monitoring and overseeing the whole process.

Activities:

- Students work in their groups looking for information.
- Each student looks for specific information related to the role he or she decided to play in the group.
- Students discuss / exchange opinions on the information they found.
- Students are asked to socialize among their classmates the information they have found on their own as part of the self-designated role in the group.
- The teacher monitors on students' progress and gives appropriate feedback.

Session number 6 (Face-to-face)

Time: 40 minutes

Method: cooperative

Type of activity: face-to-face (6th lesson)

Objective: To find anecdotic evidence/facts related to the building of the Sydney Opera House.

Warm up:

Students are prompted by the teacher to make them recall the information they have previously been looking for. The teacher may ask questions like the following to foster dialogue among students:

- What anecdotic events, do you think, may have arisen when the Opera House project was being executed?
- Did any anecdotic events surround the opening of the Opera House?
- How long did the construction of the Opera House take?
- Were there any composers related to the construction of the Opera House?

In this session students look for information to get a better understanding of what the whole process in the construction of the Opera House was like, as well as the facts that surrounded the building of the Opera House.

Students are encouraged to dialogue and share the information they have found based on the specific roles they have decided on. The teacher is constantly providing feedback, monitoring and overseeing the whole process.

Activities:

- Students work in their groups looking for information.
- Each student looks for specific information related to the role he or she decided to play in the group.
- Students discuss / exchange opinions on the information they found.
- Students are asked to socialize among their classmates the information they have found on their own as part of the self-designated role in the group.
- The teacher monitors on students' progress and gives appropriate feedback.

Session number 6 (Virtual)

Time: 40 minutes

Method: cooperative

Type of activity: Virtual (6th lesson)

Objective: To find anecdotic evidence/facts related to the building of the Sydney Opera House.

Warm up:

Wander around asking residents whether they know anecdotic facts related to the Opera House building. The teacher may ask questions like the following to foster dialogue among students:

- What anecdotic events, do you think, may have arisen when the Opera House project was being executed?
- Did any anecdotic events surround the opening of the Opera House?
- How long did the construction of the Opera House take?
- Were there any composers related to the construction of the Opera House?

In this session students look for information to get a better understanding of what the whole process in the construction of the Opera House was like, as well as the facts that surrounded the building of the Opera House.

Students are encouraged to go around the site/building looking for information. They will then have to report on the information they found to the rest of their classmates. Dialogue will be fostered based on the information they have found based on the specific roles they have decided on. The teacher is constantly providing feedback, monitoring and overseeing the whole process.

Activities:

- Students work in their groups looking for information.
- Each student looks for specific information related to the role he or she decided to play in the group.
- Students discuss / exchange opinions on the information they found.
- Students are asked to socialize among their classmates the information they have found on their own as part of the self-designated role in the group.
- The teacher monitors on students' progress and gives appropriate feedback.

Session number 7 (Face-to-face)

Time: 40 minutes

Method: cooperative

Type of activity: face-to-face (7th lesson)

Objective: To make students realize what the Sydney Opera House means/represents for the Australian People.

Warm up:

The teacher makes a round up table to make students discuss /exchange opinions on the Opera House project. This is based/related to the information they have previously been looking for. The teacher may ask questions like the following to foster dialogue among students:

- Do you have any iconic buildings in your city? What are they like?
- Do you have iconic/well known buildings that represent your country? How do those make you feel?
- How do you think Australian people feel about the Opera House?
- Would you say that there are similar feelings/you share the same feelings when related to iconic buildings? Why?

In this session students look for information to get a better understanding of what the Opera House represents for the Australian people. National identity that is related to such an iconic building.

Students are encouraged to dialogue and share the information they have found based on the specific roles they have decided on. The teacher is constantly providing feedback, monitoring and overseeing the whole process.

Activities:

- Students work in their groups looking for information.
- Each student looks for specific information related to the role he or she decided to play in the group.
- Students discuss / exchange opinions on the information they found.
- Students are asked to socialize among their classmates the information they have found on their own as part of the self-designated role in the group.
- The teacher monitors on students' progress and gives appropriate feedback.

Session number 7 (Virtual)

Time: 40 minutes

Method: cooperative

Type of activity: Virtual (7th lesson)

Objective: To make students realize what the Sydney Opera House means/represents for the Australian People.

Warm up:

Students are actively encouraged to talk to residents in the area. This will help them get an idea of what the building represents for Australian people. The teacher may ask questions like the following to foster dialogue among students:

- Do you have any iconic buildings in your city? What are they like?
- Do you have iconic/well known buildings that represent your country? How do those make you feel?
- How do you think Australian people feel about the Opera House?
- Would you say that there are similar feelings/you share the same feelings when related to iconic buildings? Why?

In this session students look for information to get a better understanding of what the Opera House represents for the Australian people. National identity that is related to such an iconic building.

Students are encouraged to dialogue and share the information they have found based on the specific roles they have decided on. The teacher is constantly providing feedback, monitoring and overseeing the whole process.

Activities:

- Students are encouraged to talk to other residents asking for their opinion about the Opera House.
- They can interview Australian residents to get a more in-depth idea of the significance of the building for the Australian identity.
- Students discuss / exchange opinions on the information they found.
- Students are asked to socialize among their classmates the information they have found on their own as part of the self-designated role in the group.
- The teacher monitors on students' progress and gives appropriate feedback.

Session number 8

Time: 40 minutes

Method: cooperative

Type of activity: face-to-face (8th lesson)

Objective: To understand the place that the Opera House has at an international level in terms of being an iconic architectural heritage building as well what it represents for international organizations such as UNESCO.

Warm up:

The teacher makes a round up table to make students discuss /exchange opinions on the Opera House project. This is based/related to the information they have previously been looking for. The teacher may ask questions like the following to foster dialogue among students:

- Do you have any iconic buildings in your city? What are they like?
- Are these iconic buildings recognized at an international level? How? Why?
- Do you think the Opera House is recognized worldwide? Why?
- How do you think Australian people feel about the Opera House?

In this session students look for information and discuss among themselves to get a better understanding of what the Opera House represent for the Australian people.

Students are encouraged to dialogue and share the information they have found based on the specific roles they have decided on. The teacher is constantly providing feedback, monitoring and overseeing the whole process.

Students are reminded of the final presentation they will hold by the end of the process.

Activities:

- Students work in their groups looking for information.
- Each student looks for specific information related to the role he or she decided to play in the group.
- Students discuss / exchange opinions on the information they found.
- Students are asked to socialize among their classmates the information they have found on their own as part of the self-designated role in the group.
- The teacher monitors on students' progress and gives appropriate feedback.

Session number 8

Time: 40 minutes

Method: cooperative

Type of activity: Virtual (8th lesson)

Objective: To understand the place that the Opera House has at an international level in terms of being an iconic architectural heritage building as well what it represents for international organizations such as UNESCO.

Warm up:

The teacher asks the students to visit similar sites that are representative for other people in other islands. The teacher may ask questions like the following to foster dialogue among students:

- Do you have any iconic buildings in your city? What are they like?
- Are these iconic buildings recognized at an international level? How? Why?
- Do you think the Opera House is recognized worldwide? Why?
- How do you think Australian people feel about the Opera House?

In this session students look for information and discuss among themselves to get a better understanding of what the Opera House represent for the Australian people.

Students are encouraged to dialogue and share the information they have found based on the specific roles they have decided on. The teacher is constantly providing feedback, monitoring and overseeing the whole process.

Students are reminded of the final presentation they will hold by the end of the process.

Activities:

- Visit other iconic buildings in other islands that are of significance for other cultures/countries.
- Each student looks for specific information related to the role he or she decided to play in the group.
- Students discuss / exchange opinions on the information they found.
- Students are asked to socialize among their classmates the information they have found on their own as part of the self-designated role in the group.
- The teacher monitors on students' progress and gives appropriate feedback.

Session number 9

Time: 40 minutes

Method: cooperative

Type of activity: face-to-face (9th lesson)

Objective: To round up the learning process.

In this final session for the Opera House topic, students will have to represent/create a role play situation in which they will explain “tourists” about the construction of the Opera House. They will be asked to create a brochure (artifact) where all of the information gathered will be summed up.

Activities:

- Students work in their groups giving the presentation the final touch.
- Each student will be in charge of a role that will be chosen by him or herself.
- Students act out what they have prepared.

Session number 9

Time: 40 minutes

Method: cooperative

Type of activity: Virtual (9th lesson)

Objective: To round up the learning process.

In this final session for the Opera House topic, students will have to represent/create a role play situation in which they will explain “tourists” about the construction of the Opera House. They will be asked to create a situation in-world where all of the information gathered will be summed up by means of explaining a new comer to the area about how the Opera House was built. This session will be recorded using Camtasia studio 7.0.

Activities:

- Students work in their groups giving the presentation the final touch.
- Each student will be in charge of a role that will be chosen by him or herself.
- Students act out what they have prepared.

Topic 2: Uluru or Ayers Rock

Session number 1 (face-to-face)

Time: 40 minutes

Method: cooperative

Type of activity: face-to-face (1st lesson)

Objective: To get understanding of the importance of “Uluru” for the traditional owners who inhabited the area.

Warm up:

The teacher brainstorms ideas to elicit on students previous knowledge about the original people who inhabited Australia. Since this information is known due to the previous topic, this will be done quickly (I hope). Then, the teacher can narrow the conversation down to the important landmarks (again) so that you can introduce the “Uluru” topic by asking questions like the following to foster dialogue among students:

- Do you remember any other landmark which is important for Australian people? Can you name them?
- Are there important landmarks here in Chile which are similar in nature to “Uluru”? Do you know their names?
- Are these landmarks also in close relation to the aboriginal people here in Chile? How? In which way?
- What do you think “Uluru” represents for the locals/aboriginal people from the area?
- Do you have any ideas about how the origin of this rock?

In this session, the teacher guides the students so that they connect (after the brainstorming) their own Chilean reality to that of Australia. Students are encouraged to dialogue and share the information they have found based on the specific roles they have decided on. The teacher is constantly providing feedback, monitoring and overseeing the whole process.

Activities:

- Students look for information about the new topic, either online or maybe/hopefully share previous knowledge they may have.
- Students can watch “youtube” videos provided by the teacher.
- Students work in their groups looking for information.
- Each student looks for specific information related to the role he or she decided to play in the group.
- Students discuss / exchange opinions on the information they found.
- Students are asked to socialize among their classmates the information they have found on their own as part of the self-designated role in the group.
- The teacher monitors on students’ progress and gives appropriate feedback.

Session number 1 (Virtual)

Time: 40 minutes

Method: cooperative

Type of activity: Virtual (1st lesson)

Objective: To get understanding of the importance of “Uluru” for the traditional owners who inhabited the area.

Warm up:

The teacher brainstorms ideas to elicit on students previous knowledge about the original people who inhabited Australia. Since this information is known due to the previous topic, this will be done quickly (I hope). Then, the teacher can narrow the conversation down to the important landmarks (again) so that you can introduce the “Uluru” topic by asking questions like the following to foster dialogue among students:

- Do you remember any other landmark which is important for Australian people? Can you name them?
- Are there important landmarks here in Chile which are similar in nature to “Uluru”? Do you know their names?
- Are these landmarks also in close relation to the aboriginal people here in Chile? How? In which way?
- What do you think “Uluru” represents for the locals/aboriginal people from the area?
- Do you have any ideas about how the origin of this rock?

In this session, the teacher guides the students so that they connect (after the brainstorming) their own Chilean reality to that of Australia. Students are encouraged to dialogue and share the information they have found based on the specific roles they have decided on. The teacher is constantly providing feedback, monitoring and overseeing the whole process.

Activities:

- Students look for information about the new topic, being teletransported by the teacher to <http://maps.secondlife.com/secondlife/Australia/142/114/1005> or maybe/hopefully share previous knowledge they may have.
- Students can watch “youtube” videos provided by the teacher.
- Students work in their groups looking for information.
- Each student looks for specific information related to the role he or she decided to play in the group.
- Students discuss / exchange opinions on the information they found.
- Students are asked to socialize among their classmates the information they have found on their own as part of the self-designated role in the group.
- The teacher monitors on students’ progress and gives appropriate feedback.

The teacher monitors on students’ progress and gives appropriate feedback.

Session number 2 (face-to-face)

Time: 40 minutes

Method: cooperative

Type of activity: face-to-face (2nd lesson)

Objective: To learn about the geology of “Uluru”. The type of rock that forms/composes it and its origin in geological terms.

Warm up:

The teacher reviews previous class contents and clarifies doubts students may have. Then, attention is drawn to Chile and its famous mountain range “The Andes” and its geological composition. The idea of doing so is to set the framework within which the teacher will elicit more information related to “Uluru” and students’ previous knowledge they may have. The teacher may start asking questions like the following to foster dialogue among students:

- Have you ever been to the “Andes” mountain range?
- Do you know how old the “Andes” mountain range is? What is it made of?
- How do you think, the “Andes” was originated?
- Are there any natural landmarks as important as the “Andes” in Australia? Can you name them?
- What do you think “Uluru” represents for the locals/aboriginal people from the area?
- Do you have any ideas about how the origin of this rock?

The teacher narrows down until the topic is introduced and students discuss among themselves and exchange information. The teacher can make use of “youtube” videos to appeal to those visual learners. The teacher is constantly providing feedback, monitoring and overseeing the whole process.

Activities:

- Students look for information about the new topic, either online or maybe/hopefully share previous knowledge they may have.
- Students can watch “youtube” videos provided by the teacher.
- Students work in their groups looking for information.
- Students discuss / exchange opinions on the information they found.
- Students are asked to socialize among their classmates the information they have found on their own as part of the self-designated role in the group.
- The teacher monitors on students’ progress and gives appropriate feedback.

Session number 2 (Virtual)

Time: 40 minutes

Method: cooperative

Type of activity: Virtual (2nd lesson)

Objective: To learn about the geology of “Uluru”. The type of rock that forms/composes it and its origin in geological terms.

Warm up:

The teacher summons students in “Australia” and from there; they go to “Uluru” island (<http://maps.secondlife.com/secondlife/Australia/170/84/28>). Once there, they are free to explore the place. To foster dialogue, the teacher may start asking questions like the following:

- Have you ever been to the “Andes” mountain range?
- Do you know how old the “Andes” mountain range is? What is it made of?
- How do you think, the “Andes” was originated?
- Are there any natural landmarks as important as the “Andes” in Australia? Can you name them?
- What do you think “Uluru” represents for the locals/aboriginal people from the area?
- Do you have any ideas about how the origin of this rock?

As previously mentioned, students are free to explore the area and talk to other residents or among themselves to exchange information/opinions on what they have seen. Attention is drawn to Chile and its famous mountain range “The Andes” and its geological composition. The teacher is constantly providing feedback, monitoring and overseeing the whole process.

Activities:

- Students look for information about the new topic, either in-world, websites or maybe/hopefully share previous knowledge they may have.
- Students work in their groups looking for information.
- Students discuss / exchange opinions on the information they found.
- Students are asked to socialize among their classmates the information they have found on their own as part of the self-designated role in the group.
- The teacher monitors on students’ progress and gives appropriate feedback.

Session number 3 (face-to-face)

Time: 40 minutes

Method: cooperative

Type of activity: face-to-face (3rd lesson)

Objective: To expand students' knowledge on flora and fauna that is around "Uluru" area.

Warm up:

The teacher can make use of previously used slides on Australia to prompts students and make them recall the information about Australia's native flora and fauna. Most likely, students will talk/mention the most iconic animals such as koalas and kangaroos, but she can draw students' attention to some other species such as bats, reptiles, red kangaroos, bush turkey, emu and lizards (like sand goana and perentie). To foster conversation/discussion about this she can ask questions like the following (to make the connection between Chilean flora and fauna and the Australian one:

- Are there any iconic animals in the Chilean shield? Which ones are those?
- What about the Australian shield? Which ones are the ones?
- Where do you think those animals live in Australia?
- Which animals do you think live in the region called "the outback"?

The teacher allows the students to discuss among themselves and exchange ideas based on the information they may know. They can look for information online and in websites. They can talk among themselves to organize how they will divide themselves to search for information.

The teacher is present to guide the process and provide the corrective feedback when necessary.

Activities:

- Students work in their groups looking for information.
- Each student looks for specific information related to the role he or she decided to play in the group.
- They can look for youtube videos that provide extra information.
- Students discuss / exchange opinions on the information they found.
- The teacher monitors on students' progress and gives appropriate feedback.

Session number 3 (Virtual)

Time: 40 minutes

Method: cooperative

Type of activity: Virtual (3rd lesson)

Objective: To expand students' knowledge on flora and fauna that is around "Uluru" area.

Warm up:

The teacher summons students in the "Uluru" area and allows them to see the fauna that is there (mostly camels they can ride). She can then make students recall information about Australia's native flora and fauna. Most likely, students will talk/mention the most iconic animals such as koalas and kangaroos, but she can draw students' attention to some other species such as bats, reptiles, red kangaroos, bush turkey, emu and lizards (like sand goana and perentie). To foster conversation/discussion about this she can ask questions like the following (to make the connection between Chilean flora and fauna and the Australian one):

- Are there any iconic animals in the Chilean shield? Which ones are those?
- What about the Australian shield? Which ones are the ones?
- Where do you think those animals live in Australia?
- Which animals do you think live in the region called "the outback"?

The teacher allows the students to discuss among themselves and exchange ideas based on the information they may know. They can look for information online, websites, and in-world too. They can talk to other residents and organize themselves the way they will divide themselves to search for information.

The teacher is present to guide the process and provide the corrective feedback when necessary.

Activities:

- Students work in their groups looking for information.
- Each student looks for specific information related to the role he or she decided to play in the group.
- Students discuss / exchange opinions on the information they found.
- The teacher monitors on students' progress and gives appropriate feedback.

Session number 4 (face-to-face)

Time: 40 minutes

Method: cooperative

Type of activity: face-to-face (4th lesson)

Objective: To learn about the history of “Uluru” and how it was discovered.

Warm up:

The teacher can make the connection of how South America and countries such as Peru, Bolivia, etc were settled and discovered by the Spanish immigrants to establish the connection and common grounds with Australia. She can talk a bit about Macchu Picchu, for example, to lead the conversation towards the way the first Europeans discovered “Uluru” and its surroundings. To foster conversation/discussion about this she can ask questions like the following (to make the connection between the South American context and the Australian one):

- Do you know about the aboriginal inhabitants who lived in Peru and their iconic city?
- How was it discovered? /what happened when the Spanish people got there?
- Do you know of any Australian area/region which is famous for the natural formations it has? How was it discovered?
- What do you think happened when this area was being discovered? Do you think it was similar to what happened in the South American context?

The teacher allows the students to discuss among themselves and exchange ideas based on the information they may know. They can look for information online and in websites. She can show videos from to enlighten/foster discussion amongst students. They will divide themselves to search for information.

The teacher is present to guide the process and provide the corrective feedback when necessary.

Activities:

- Students look for youtube videos that provide extra information on the topic.
- Students surf the net looking for information.
- Students work in their groups looking for information.
- Each student looks for specific information related to the role he or she decided to play in the group.
- Students discuss / exchange opinions on the information they found.
- The teacher monitors on students’ progress and gives appropriate feedback.
- The teacher fosters discussion by asking follow up questions based on the initial ones.

Session number 4 (Virtual)

Time: 40 minutes

Method: cooperative

Type of activity: Virtual (4th lesson)

Objective: To learn about the history of “Uluru” and how it was discovered

Warm up:

The teacher summons students in the “Uluru” region and introduces the topic by making the connection of how South America (Peru, Bolivia, etc) was settled and discovered by the Spanish immigrants. This is done to establish the connection and common grounds with Australia. She can talk a bit about Macchu Picchu for example. This will lead the conversation towards the way the first Europeans discovered “Uluru” and its surroundings. To foster conversation/discussion about this she can ask questions like the following (to make the connection between the South American context and the Australian one:

- Do you know about the aboriginal inhabitants who lived in Peru and their iconic city?
- How was it discovered? /what happened when the Spanish people got there?
- Do you know of any Australian area/region which is famous for the natural formations it has? How was it discovered?
- What do you think happened when this area was being discovered? Do you think it was similar to what happened in the South American context?

The teacher allows the students to discuss among themselves and exchange ideas based on the information they may know. They can look for information online, websites, and in-world too. They can talk to other residents and organize themselves the way they will divide themselves to search for information.

The teacher is present to guide the process and provide the corrective feedback when necessary.

Activities:

- Students work in their groups, in-world looking for information.
- Each student looks for specific information related to the role he or she decided to play in the group.
- Students discuss / exchange opinions on the information they found.
- The teacher monitors on students’ progress and gives appropriate feedback.
- Students can also surf the net looking for information.
- Each student looks for specific information related to the role he or she decided to play in the group.
- Students discuss / exchange opinions on the information they found.
- The teacher monitors on students’ progress and gives appropriate feedback.
- The teacher fosters discussion by asking follow up questions based on the initial ones.

Session number 5 (face-to-face)

Time: 40 minutes

Method: cooperative

Type of activity: face-to-face (5th lesson)

Objective: To deepen students' understanding of "Uluru" and its discovery, geology, and flora and fauna.

Warm up:

The teacher prompts students to make them recall their previous exchange of information related to "Uluru" by asking questions that will elicit information based on the information they have been looking for. Teacher may ask the following questions to foster dialogue among students:

- What information have you found related to "Uluru" and its surrounding area?
- How is "Uluru" similar/different in its discovery to the one that took place in South America? Is there any specific information that has called your attention about it? Why?
- How about the flora and fauna that surrounds the area? Are there any common facts with the ones in Chile? If so, which ones?
- In relation to its geology, what interesting facts have you found that have called your attention? Are there any common facts with the ones in Chile and more specifically the Andes mountain range? If so, which ones?

In this session students keep on working/looking for information to get a better understanding of what the whole process in the discovery of "Uluru" and making it a park, including its geology, and flora and fauna, have called their attention and need to look deeper into it. The teacher is constantly providing feedback, monitoring and overseeing the whole process.

Activities:

- Students work in their groups looking for information.
- Each student looks for specific information related to the role he or she decided to play in the group.
- Students discuss / exchange opinions on the information they found.
- Students are asked to socialize among their classmates the information they have found on their own as part of the self-designated role in the group.
- The teacher monitors on students' progress and gives appropriate feedback.

Session number 5 (Virtual)

Time: 40 minutes

Method: cooperative

Type of activity: virtual (5th lesson)

Objective: To deepen students' understanding of "Uluru" and its discovery, geology, and flora and fauna.

Warm up:

The teacher encourages the students to wander around the site and talk/look for information either in-world or websites. They can also talk to other residents for information. Teacher may ask questions like the following to foster dialogue among students:

- What information have you found related to "Uluru" and its surrounding area?
- How is "Uluru" similar/different in its discovery to the one that took place in South America? Is there any specific information that has called your attention about it? Why?
- How about the flora and fauna that surrounds the area? Are there any common facts with the ones in Chile? If so, which ones?
- In relation to its geology, what interesting facts have you found that have called your attention? Are there any common facts with the ones in Chile and more specifically the Andes mountain range? If so, which ones?

In this session students keep on working/looking for information to get a better understanding of what the whole process in the discovery of "Uluru" and making it a park, including its geology, and flora and fauna, have called their attention and need to look deeper into it. The teacher is constantly providing feedback, monitoring and overseeing the whole process.

Activities:

- Students work in their groups looking for information.
- Each student looks for specific information related to the role he or she decided to play in the group.
- Students discuss / exchange opinions on the information they found.
- Students are asked to socialize among their classmates the information they have found on their own as part of the self-designated role in the group.
- The teacher monitors on students' progress and gives appropriate feedback.

Session number 6 (face-to-face)

Time: 40 minutes

Method: cooperative

Type of activity: face-to-face (6th lesson)

Objective: To learn about the myths, legends and aboriginal traditions related to “Uluru”.

Warm up:

The teacher recycles previous knowledge related to students and their looking of information related to “Uluru” that they have been doing so far. This session, the teacher makes the connection between “Uluru” and the Chilean rich mythology, legends and aboriginal traditions. The teacher starts with a brain-storming activity and asks questions like the following to foster dialogue among students:

- What well known myths and legends and aboriginal traditions do you know about Chile and their different regions? (North/center / South)
- Are there any regional myths, legends and aboriginal traditions that you know about? Can you share them with the rest of the class?
- Which one of those, do you think/know, represents us internationally?
- Do you think there are similar ones related to “Uluru” and its area?
- Can you guess if there are similar ones to the aboriginal ones we have here in Chile?

After the brain-storming activity, the teacher encourages students to dialogue and share the information they have found based on the specific roles they have decided on. The teacher is constantly providing feedback, monitoring and overseeing the whole process.

Activities:

- Students work in their groups looking for information.
- Each student looks for specific information related to the role he or she decided to play in the group.
- Students discuss / exchange opinions on the information they found.
- Students are asked to socialize among their classmates the information they have found on their own as part of the self-designated role in the group.
- The teacher monitors on students’ progress and gives appropriate feedback.

Session number 6 (Virtual)

Time: 40 minutes

Method: cooperative

Type of activity: Virtual (6th lesson)

Objective: To learn about the myths, legends and aboriginal traditions related to “Uluru”.

Warm up:

The teacher encourages the students to wander around the site and explore it. The teacher recycles previous knowledge related to students and their looking of information related to “Uluru” that they have been doing so far. This session, the teacher makes the connection between “Uluru” and the Chilean rich mythology, legends and aboriginal traditions. The teacher starts with a brain-storming activity and asks questions like the following to foster dialogue among students:

The teacher may ask questions like the following to foster dialogue among students:

- What well known myths and legends and aboriginal traditions do you know about Chile and their different regions? (North/center / South)
- Are there any regional myths, legends and aboriginal traditions that you know about? Can you share them with the rest of the class?
- Which one of those, do you think/know, represents us internationally?
- Do you think there are similar ones related to “Uluru” and its area?
- Can you guess if there are similar ones to the aboriginal ones we have here in Chile?

After the brain-storming activity, the teacher encourages students to dialogue and share the information they have found based on the specific roles they have decided on. Students are encouraged to go around the site looking for information. They will then have to report on the information they found to the rest of their classmates. Dialogue will be fostered based on the information they have found based on the specific roles they have decided on. The teacher is constantly providing feedback, monitoring and overseeing the whole process.

Activities:

- Students work in their groups looking for information.
- Each student looks for specific information related to the role he or she decided to play in the group.
- Students discuss / exchange opinions on the information they found.
- Students are asked to socialize among their classmates the information they have found on their own as part of the self-designated role in the group.
- The teacher monitors on students’ progress and gives appropriate feedback.

Session number 7 (face-to-face)

Time: 40 minutes

Method: cooperative

Type of activity: face-to-face (7th lesson)

Objective: To learn about the type of climate in the “Uluru” area.

Warm up:

The teacher makes a round up table to make students discuss /exchange opinions on “Uluru” based on what they have already found/researched on. Then, she narrows down the topic (to make the contrast with the Chilean reality) to weather and climate in the region. Students are encouraged to guess/brain-storm what type of climate/weather may be in the area where “Uluru” is. The teacher may ask questions like the following to foster dialogue among students:

- What types of climate do we have here in Chile?
- Does the climate change according to the latitude that we talk about?
- How different is the weather up- north, center and down-south?
- What do you think climate is like where “Uluru” is located?

This seventh session is devoted to expand students’ understanding of the type of climate and the different seasons that are present in the “Uluru” area.

Students are encouraged to dialogue and share the information they have found based on the specific roles they have decided on. The teacher is constantly providing feedback, monitoring and overseeing the whole process.

Activities:

- Students work in their groups looking for information.
- Each student looks for specific information related to the role he or she decided to play in the group.
- Students discuss / exchange opinions on the information they found.
- Students are asked to socialize among their classmates the information they have found on their own as part of the self-designated role in the group.
- The teacher monitors on students’ progress and gives appropriate feedback.

Session number 7 (Virtual)

Time: 40 minutes

Method: cooperative

Type of activity: Virtual (7th lesson)

Objective: To learn about the type of climate in the “Uluru” area.

Warm up:

The teacher makes a round up table to make students discuss /exchange opinions on “Uluru” based on what they have already found/researched on. Then, she narrows down the topic (to make the contrast with the Chilean reality) to weather and climate in the region. Students are encouraged to guess/brain-storm what type of climate/weather may be in the area where “Uluru” is. The teacher may ask questions like the following to foster dialogue among students:

- What types of climate do we have here in Chile?
- Does the climate change according to the latitude that we talk about?
- How different is the weather up- north, center and down-south?
- What do you think climate is like where “Uluru” is located?

This seventh session is devoted to expand students’ understanding of the type of climate and the different seasons that are present in the “Uluru” area.

Students are encouraged to dialogue and share the information they have found based on the specific roles they have decided on. The teacher is constantly providing feedback, monitoring and overseeing the whole process.

Activities:

- Students are encouraged to talk to other residents asking for information related to “Uluru” and its climate/weather.
- They can interview Australian residents to get a more in-depth idea of the significance of the building for the Australian identity.
- Students discuss / exchange opinions on the information they found.
- Students are asked to socialize among their classmates the information they have found on their own as part of the self-designated role in the group.
- The teacher monitors on students’ progress and gives appropriate feedback.

Appendix 5: Ethical Clearance



The School of Education

CRICOS PROVIDER NUMBER 00025B

6 August 2012

Mr Jamie Garcia Salinas
School of Education

Email: Jaime.garciasalinas@uqconnect.edu.au

S/N: 42454377

Ethical Clearance Number: 12-028

Dear Jamie,

I am pleased to advise that on the 1 August 2012 ethical clearance was granted for your project "Pre-service Chilean teacher's perceptions of cooperative culture teaching in a face-to-face and 3D virtual environment: an exploratory study".

I would also like to remind you that any correspondence associated with your project (consent forms, information sheets etc.) must be printed on official UQ letterhead (available from the School of Education Reception).

If you have any questions regarding this matter please do not hesitate to contact me.

I wish you well with your studies.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Christel Schoenberger', written over a faint, larger version of the same signature.

Christel Schoenberger
Senior Administrative Officer
(Postgraduate & Higher Degrees)

Appendix 6: Consent forms and Information sheets

Permission-Givers

Universidad Santo Tomas, Head of the School of Education – letter seeking approval

Dear Luz Jara Modinger

Head of the School of Education

Universidad Santo Tomas, **Concepcion**

I wish to seek approval to conduct my PhD research study in Universidad Santo Tomas and involve teacher educators and pre-service teacher trainees from the English programme in this research during the period from August – December 2012. I am a PhD student in the School of Education, at the University of Queensland, Australia. The title of my project is “Pre-service Chilean teacher’s perceptions of cooperative culture teaching in a face-to-face and 3D virtual environment: an exploratory study”. It aims to explore the perceptions of pre-service teachers working cooperatively to learn Australian culture in face-to-face and 3D virtual environment (Second Life) in order to explore the effects that a teacher has in virtual environments to learning, identify the difference that the use of a 3D virtual environment makes to cooperative learning when teaching culture to Chilean pre-service teachers and compare the use of a 3D virtual approach to teaching culture when compared to a face-to-face, cooperative learning approach.

The teacher educators will be invited to participate on a voluntary basis and will be provided with an information and consent forms. The participants will be able to withdraw from the project at any time and without any penalty. All data material will be kept secure in The University of Queensland archives as well as hard drives accessed only by the researcher and supervisors. No participant will be identified as codes will be used. This study has been cleared in accordance with the ethical review guidelines and processes of The University of Queensland. These guidelines are endorsed by the University's principal human ethics committee, the Human Experimentation Ethical Review Committee, and registered with the Australian Health Ethics Committee as complying with the National Statement.

I think that this study will benefit our School of Education and teacher educators as the information gathered through interviews with the participants, will help create a wholesome picture of the benefits that a 3D virtual environment has for teaching and learning culture in Chilean pre-service teachers.

Thank you for taking the time to consider my request. I look forward to hearing from you.

Yours sincerely
Jaime Garcia Salinas

Teacher educator participant information sheet

Dear teacher educator participant,

My name is Jaime Garcia Salinas, research higher degree student at the University of Queensland, and I am conducting a study whose aim is to explore the learning that takes place in a traditional face-to-face cooperative learning environment and an online 3D virtual learning environment (Second Life) for teaching Australian culture to pre-service teachers of English in Chile.

The title of the project is “Pre-service Chilean teachers’ perceptions of cooperative culture teaching in a face-to-face and 3D virtual environment: An exploratory study”.

Since at present there is no study that directly compares the learning that occurs in these two types of environments in the Chilean pre-service teacher education context, it is important to explore if the benefits that a structured cooperative group work has, that is, to involve participants in working together by creating interdependence and motivating them to help and support each other’s endeavours, are also transferred to virtual settings of teaching and learning.

This research project will take place during the second academic semester of 2012. During this time you will be asked to participate in a number of different activities such as interviews which will be held at the beginning, during and at the end of the study with the aim of getting your perceptions and opinion on cooperative work. These activities will take no longer than 1 hour each time. It is also important that you know that video recording will take place, both face-to-face and in-world as an important element of analysis to get deeper insight into cooperative work. There will also be workshops on establishing cooperative group work in both face-to-face and virtual contexts that you will be required to attend for its successful implementation.

This research is being undertaken by Jaime Garcia Salinas as a part of the requirements for the research higher degree at the University of Queensland under the supervision of Dr Robyn Gillies and Dr Chris Campbell.

Participation in this study is completely voluntary and you are free to withdraw from this study at any time without prejudice or penalty. If you wish to withdraw, simply tell the researcher and your participation in this research project will end. If you do withdraw from the study, any record of the information that you have given to that point will be destroyed and will not be included in the study. Confidentiality and anonymity of data is assured: personal information collected for the study is confidential and pseudonyms will be used for coding and storing of data as well as for the analysis. Upon request, you will be provided with a draft

transcript of your interview. The data will be stored in a secure computer and a hard drive with password protected access limited directly to the researcher and at the researcher's office at University of Queensland.

This study has been cleared in accordance with the ethical review processes of the University of Queensland and within the guidelines of the National Statement on Ethical Conduct in Human Research. You are, of course, free to discuss your participation with project staff, Jaime Garcia Salinas (contactable on: Jaime.garciasalinas@uqconnect.edu.au). If you would like to speak to an officer of the University not involved in the study, you may contact the University of Queensland Ethics Officer, Michael Tse, or e-mail: humanethics@research.uq.edu.au

If you would like to learn the outcome of the study in which you are participating, please feel free to contact me at the email above and I will send you an abstract of the study and details of the findings. You can also contact my academic advisors for this study if you have further concerns as follows:

Dr. Robyn Gillies: r.gillies@uq.edu.au

Dr. Chris Campbell: chris.campbell@uq.edu.au

If you have any further questions on this project or about your participation in it, you are welcome to contact me directly by email at Jaime.garciasalinas@uqconnect.edu.au.

If you would like to gain feedback or information about your participation in it or the completed study, please let me know.

I thank you for your consideration and hope you will agree to participate in this research project.

Yours sincerely,

Jaime Garcia Salinas

Faculty of Social and Behavioural Sciences
School of Education
The University of Queensland
Brisbane QLD 4072, Australia
Office room: 529, Building 24
Tel: +61 33656510
Fax: +61 733651388
Email: Jaime.garciasalinas@uqconnect.edu.au

Pre-service teacher participant consent form

Pre-service Chilean teachers' perceptions of cooperative culture teaching in a face-to-face and 3D virtual environment: An exploratory study.

Informed Consent Form for Pre-service Teachers

I, *(participant's name)* _____

Hereby agree to being a participant in the above research project.

- I have read the information on the Participant Information Sheet which is relevant to this research project and understand that this study will take place over one academic semester.
- I understand that the individual interviews and the focus group interviews will be digitally recorded so that the researcher can transcribe the sessions.
- I understand that the researcher conducting this study abides by the principles governing the ethical conduct of research and, at all times, avows to protect the interests of all participants. This form and the accompanying Participant Information Sheet have been given to you for your own protection, and contain an outline of the proposed study.
- I am aware that my participation is confidential, and that I am not making comments or sharing this information with anybody else. I am also aware that I am free to withdraw my participation and my data at any time without penalty. I hereby give consent to participate in the experiment outlined to me in the information sheet.

Participant's signature		Date:	
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Researcher's Full Name:	Jaime Garcia Salinas		
Researcher's signature		Date:	

This study has been cleared in accordance with the ethical review processes of the University of Queensland and within the guidelines of the National Statement on Ethical Conduct in Human Research. You are, of course, free to discuss your participation with project staff, Jaime Garcia Salinas (contactable on: Jaime.garciasalinas@uqconnect.edu.au). If you would like to speak to an officer of the University not involved in the study, you may contact the University of Queensland Ethics Officer, Michael Tse, or e-mail: humanethics@research.uq.edu.au

If you would like to learn the outcome of the study in which you are participating, please feel free to contact me at the email above and I will send you an abstract of the study and details of the findings. You can also contact my academic advisors for this study if you have further concerns as follows:

Dr. Robyn Gillies: r.gillies@uq.edu.au

Dr. Chris Campbell: chris.campbell@uq.edu.au

Pre-service teacher participant information sheet

Dear potential participant,

My name is Jaime Garcia Salinas, research higher degree student at the University of Queensland, and I am conducting a study whose aim is to explore the learning that takes place in a traditional face-to-face cooperative learning environment and an online 3D virtual learning environment (Second Life) for teaching Australian culture to pre-service teachers of English in Chile.

The title of the project is “Pre-service Chilean teachers’ perceptions of cooperative culture teaching in a face-to-face and 3D virtual environment: An exploratory study”.

Since at present there is no study that directly compares the learning that occurs in these two types of environments in the Chilean pre-service teacher education context, it is important to explore if the benefits that a structured cooperative group work has, that is, to involve participants in working together by creating interdependence and motivating them to help and support each other’s endeavours, are also transferred to virtual settings of teaching and learning.

This research project will take place during the second academic semester of 2012. During this time you will be asked to participate in a number of different data collecting activities; you will be asked to complete a questionnaire and an achievement test at the beginning and at the end of the study with the aim of helping us to gain a deeper understanding of the type of processes, perceptions and knowledge gain that you go through as you adapt to working cooperatively either in a face-to-face or a virtual environment. There will also be focus groups and interviews in which you will be asked to participate at the beginning, during and at the end of the study both face-to-face and in-world. These activities will take no longer than 1 hour each time. It is also important that you know that video recording will take place, both face-to-face and in-world as an important element of analysis to get deeper insight in cooperative work. You are asked to keep all of the information shared in the focus groups as confidential and not make comments about it to anybody else.

This research is being undertaken by Jaime Garcia Salinas as a part of the requirements for the research higher degree at the University of Queensland under the supervision of Dr Robyn Gillies and Dr Chris Campbell.

Participation in this study is completely voluntary and you are free to withdraw from this study at any time without prejudice or penalty. If you wish to withdraw, simply tell the researcher and your participation in this research project will end. If you do withdraw from the study, any record of the information that you have given to that point will be destroyed and will not be included in the study. Confidentiality and anonymity of data is assured: personal information collected for the study is confidential and pseudonyms will be used for coding and storing of data as well as for the analysis. Upon request, you will be provided with a draft transcript of your interview. The data will be stored in a secure computer and a hard drive with password protected access limited directly to the researcher and at the researcher's office at University of Queensland.

This study has been cleared in accordance with the ethical review processes of the University of Queensland and within the guidelines of the National Statement on Ethical Conduct in Human Research. You are, of course, free to discuss your participation with project staff, Jaime Garcia Salinas (contactable on: Jaime.garciasalinas@uqconnect.edu.au). If you would like to speak to an officer of the University not involved in the study, you may contact the University of Queensland Ethics Officer, Michael Tse, or e-mail: humanethics@research.uq.edu.au

If you would like to learn the outcome of the study in which you are participating, please feel free to contact me at the email above and I will send you an abstract of the study and details of the findings. You can also contact my academic advisors for this study if you have further concerns as follows:

Dr. Robyn Gillies: r.gillies@uq.edu.au

Dr. Chris Campbell: chris.campbell@uq.edu.au

If you have any further questions on this project or about your participation in it, you are welcome to contact me directly by email at Jaime.garciasalinas@uqconnect.edu.au.

If you would like to gain feedback or information about your participation in it or the completed study, please let me know.

I thank you for your consideration and hope you will agree to participate in this research project.

Yours sincerely,

Jaime Garcia Salinas

Faculty of Social and Behavioural Sciences
School of Education
The University of Queensland
Brisbane QLD 4072, Australia
Office room: 529, Building 24
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Fax: +61 733651388
Email: Jaime.garciasalinas@uqconnect.edu.au

Appendix 7: Sample Interview Protocol

Possible Interview questions for the face-to-face group.

- 1) How did you feel when interacting in the structured group?
- 2) Did you feel you were treated with respect in your group?
- 3) Did you feel free to give your opinions and share when interacting in the group?
- 4) Did you have a say in decisions made by your group?
- 5) Was the group encouraging to work with?
- 6) What do you think the teacher's role is?
- 7) How did the teacher make you feel when working in your group?
- 8) Was it easy to carry out the group project assigned in your group?
- 9) Did you seek help from your peers when working in your group?
- 10) Did you make an effort to do your best work when working in your group?
- 11) Does the teacher facilitate the learning process?
- 12) Is the teacher presence relevant when working in your group?
- 13) Did you feel that group work is fun?
- 14) How was group interaction?
- 15) Were expectations in behavior met when working in your group?

Possible Interview questions for the virtual group.

- 1) How did you feel when interacting virtually in your group?
- 2) How were you treated when working virtually?
- 3) How free did you feel when giving your opinions, sharing and interacting in-world?
- 4) Tell me how you made decisions in your virtual group?
- 5) What was the virtual environment like for working in?
- 6) What do you think the virtual teacher's role is?
- 7) How did the teacher make you feel when working virtually?
- 8) Tell me how you managed the group project assigned in-world?
- 9) Did you seek help from your peers when working in the Second Life platform?
- 10) Did you make an effort to do your best work when working in-world?
- 11) What do you think of the role of the virtual teacher?
- 12) Is the teacher presence relevant in this virtual environment?
- 13) Did you feel that virtual group work is fun?
- 14) How was the virtual group interaction?
- 15) Were expectations in behavior met when working in your virtual group?

Appendix 8: Experts' profile

1) Carlos Campusano is an English teacher from the Universidad Metropolitana de Ciencias de la Educacion, Santiago, Chile. He has nine years of teaching experience at primary, secondary and adult learners at Tronwell language center. He has a Master of Education in ELT from the Northern University of Malaysia and is a current PhD student at the same university. His area of interest is related to oral corrective feedback (OCF), preferences, and perceptions among high school teachers and students.

2) Jaime Hernandez has a Master of Arts in TESL (Teaching English as a Second Language) from Saint Cloud State University of Minnesota in the USA. With nine years of teaching experience, Jaime also has a Master in Linguistics from the Universidad de Concepcion, Chile. He is currently teaching phonetics and phonology, English grammar, and linguistics to undergraduate students at the Universidad Catolica de la Santisima Concepcion. His fields of study are CALL: Computer Assisted language learning for ESL students. Teaching and learning process and the use of computer applications for L2 Acquisition with focus on the listening skill as well as applied linguistics: Acquisition strategies of L2 through vocabulary lexis for communicative purposes.

3) Michael Ellsworth has a Bachelor of Arts in linguistics from the University of Chicago in the USA and a Master of Arts in Applied Linguistics/TESOL from the University of Illinois at Chicago. He has worked as an English communication, writing, literature, and linguistics professor at Universidad Santo Tomás, Concepción, Chile, and other Chilean universities. His chief teaching interest is academic writing among second language learners, and he has researched the use of Spanish and English in American fast food restaurants.

4) Lilian Jansson is an English teacher from the Universidad de La Serena, Chile, with 15 years of teaching experience. She has a diploma in educational computing and another one in management and educational leadership from Universidad de Concepcion. She has a Masters in Educational sciences with a specialization in didactics and pedagogical innovation.

5) Cristian Sanhueza has 14 years of teaching experience at primary, secondary and university levels. He is a teacher of English and translator from the Universidad del Bio-Bio, Chillan, Chile. He has a master in Linguistics with specialization in English language from the Universidad de Chile and is a current PhD student at the Universidad de

Concepcion. His areas of interest are English grammar, dialectology, ethno linguistics, and discourse analysis.

6) Patricia Osorio-Baeza is an English-Spanish translator from Universidad de Concepcion, Chile. She has 11 years of teaching experience mainly in language institutes. She has been the Director of the English/Spanish translation and interpreting studies program at Instituto Chileno-Britanico de Cultura, Concepcion, Chile. She is the current Centre Exams Manager for Cambridge English Language Assessment in Chile. She is also the current director of studies for the English/Spanish translation and interpreting studies program at Instituto Profesional Santo Tomas, Concepcion. She is senior lecturer in translation theory and practice at Instituto Profesional Santo Tomas, Concepcion.

7) Sandra Morales is a Spanish/English/French translator from the Universidad de Concepcion, Chile. She has 10 years of teaching experience at university level, being the head of the English program at Universidad de Las Americas, Concepcion, Chile. She has a master in linguistics from Universidad de Concepcion and is a current applied linguistics PhD student and teaching assistant at the University of Newcastle upon Tyne, England.

8) Claudio Leiva is a certified (CAE) teacher of English from the Universidad del Bio-Bio, Chillan, Chile. His teaching experience ranges from primary, secondary to undergraduate. He is head of the English department at "Colegio Pinares" and has coached different workshops for teachers working in the public school system in the Bio-Bio region.

9) Geovanna Pena is a certified (CAE) English teacher from the Universidad de Concepcion. She has eleven years of teaching experience, mostly in language institutes and at university level. She has a master in education from the Universidad de Concepcion and a diploma in the area of pedagogy in tertiary education. She has attended several seminars and is currently teaching English language, curriculum, and teaching practice seminar to undergraduate students at university level.