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SELF-ORGANISED LEARNING ENVIRONMENTS IN HIGHER EDUCATION AS A TOOL FOR LIFELONG LEARNING.

Entornos de Aprendizaje Auto-Organizados en la Educación Superior como herramienta para el aprendizaje a lo largo de la vida.

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"BE THE CHANGE THAT YOU WANT TO SEE IN THE WORLD"

GANDHI, M.

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RESUMEN.

El presente Trabajo Final de Grado se basa en el diseño de una propuesta didáctica para implementar Entornos de Aprendizaje Auto-organizados (EAAO) en Educación Superior. Este nuevo escenario de aprendizaje contempla actividades que utiliza una metodología de investigación colaborativa mediante la resolución de preguntas curriculares. Así para aumentar las estrategias de aprendizaje permanente de estudiantes de nuevo acceso. Además de analizar los perfiles de aprendizaje de los estudiantes de hoy en este mundo cambiante.

Esta propuesta se concreta en cinco acciones principales: la primera se aplica el Inventario Efectivo de Aprendizaje Permanente (ELLI) para recoger datos sobre los perfiles de los nuevos estudiantes. La segunda contempla la adaptación del EAAO de acuerdo con los datos obtenidos previamente, para optimizar el proceso. La tercera incluye la fase de preparación, donde se detallan los requerimientos necesarios para llevar a cabo una sesión EAAO. La cuarta acción es la implementación de la propuesta con todos los momentos correspondientes (Introducción de la pregunta, investigación y repaso), seguido de la etapa de evaluación y, finalmente, la administración del post-test con el fin de determinar si la sesión EAAO se revela como eficaz en el aumento de estrategias de aprendizaje permanente de los estudiantes universitarios.

Del mismo modo, con la intención de evaluar la propuesta de intervención didáctica innovadora fue entrevistado un grupo de profesores y profesoras de la Facultad de Educación de la Universidad de Extremadura. A partir de sus contribuciones junto con una auto-evaluación de la misma se ha elaborado un matriz DAFO. Los datos recabados nos afirman que hay una necesidad de un cambio metodológico en la Educación Superior. También que la intervención diseñada se esfuerza en mejorar la auto-conciencia de los participantes acerca de la enseñanza y el aprendizaje. En definitiva, ayuda a mantener la responsabilidad del proceso de aprendizaje en los estudiantes y además proporciona una oportunidad para poner en práctica actividades de aprendizaje colaborativo y tareas auto-gestionadas para estudiantes de Educación Superior.

Palabras Clave: Innovación docente, Educación Superior, Tecnologías Digitales, Entornos de Aprendizaje Auto-Organizados.

ABSTRACT.

This degree dissertation aims to design a teaching proposal for implementing Self-Organizing Learning Environments (SOLE) in Higher Education. This new learning scenario contemplates activities that use a collaborative researching methodology through questions as the curricular medium. So to increase new-entry student's lifelong learning strategies. In addition to analysing learner's profiles in today's ever changing world.

The proposal defines five main actions; the first is to administer the Effective Lifelong Learners Inventory (ELLI) to collect data on student's profiles. The second contemplates the SOLE session adaption in regards to the data obtained previously as to optimize the process. The third initiates the preparation phase, which details the necessary provisions to conduct a SOLE session. The fourth action is the implementation of the proposal with all of the corresponding moments (question introduction, research and review step), followed by its evaluation and finally the administration of the post-test in order to determine if the SOLE session proves effective in increasing student's lifelong learning strategies.

Similarly, with the intention of evaluating the proposed innovative educational intervention was interviewed a group of lecturers from the Faculty of Education at the University of Extremadura. From their contributions along with a self-evaluation a SWOT matrix was elaborated. The data collected affirms that there is a need for a methodological change in higher education. In short, helping to retain the responsibility of the learning process on students. Finally, it also provides an opportunity to implement collaborative learning activities and self- organized tasks for Higher Education students.

Key Words: teaching innovation, Higher Education, Lifelong Learning, Digital Technologies, Self-Organized Learning Environments.

INTRODUCTION.

The increasing social demand of an educational reform is taking centre stage as the teaching and learning process is losing effectiveness. It is beginning to become obsolete, if it is not so already, due to the fact that nowadays the profile of learners and of course, the context in which they maneuver is completely different to those of the previous century, on which the education system was based. In other words, the society in which we live is a dynamic construct that depends more and more on digital technologies. For this reason the profile of students in evolving in parallel to social demands and education is falling behind.

This degree dissertation aims to design a teaching proposal for implementing Self-Organizing Learning Environments (SOLE) in Higher Education, with this it intends to provide students with a new perspective of teaching. This new learning scenario contemplates activities that use a collaborative researching methodology through questions as the curricular medium. So to increase new-entry student's lifelong learning strategies. In addition to analysing learner's profiles in today's ever changing world. This supposes a challenge for universities to update their methods and to keep in touch with new-entry profiles.

The proposal defines five main actions; the first is to administer the Effective Lifelong Learners Inventory (ELLI) to collect data on student's profiles. Said inventory is made up of seven different dimensions which quantify the learning power of each student. The first dimension documents the amount of creativity of a student. The second determines the growth orientation of a learner. The third relates to the critical curiosity of an individual. Meanwhile, the fourth marks how a student is able to make a meaning. The fifth quantifies the grade of dependence or resilience that a subject has when pursuing a task. The sixth measures the level of ability to create relationships of how isolated a learner is. Finally, the seventh dimension calculates the strategic awareness of an individual as to being robotic.

The second action of the proposed intervention contemplates the SOLE session adaption in regards to the data obtained previously as to optimize the process. In other

words, by analysing the type of learners that will enrol in the course, teachers can plan different activities in the SOLE in order to connect with the varied student's profiles.

The third initiates the preparation phase, which details the necessary provisions to conduct a SOLE session. In which the course syllabus would have to be transformed into questions, as this methodology is based on Problem-Based Learning principles. In addition to creating a modified environment suited to the implementation of the learning scenario, such as a group work space with internet connection. The fourth action is the implementation of the proposal with all of the corresponding moments; 1) the question introduction step, where the teacher evokes knowledge and launches the curricular question; 2) the research step, in which student's research for answers, whilst documenting their actions in a Blog via social networks. Meanwhile the teacher is assessing individuals work and performance through the use of a rubric; 3) The Review step that agglutinates all of the findings through conferencing, again in this step while students are presenting their evidence other peers will be assessing using a modifies rubric.. Once the steps had been completed, they would be followed by an evaluation stage in which students would have to create a portfolio and complete a short questionnaire which would provide teachers with qualitative information for a SWOT Matrix. To end with, teachers would administer the ELLI post-test in order to determine if the SOLE session proves effective in increasing student's lifelong learning strategies.

As a means to find out what current staff feel about this proposal, lecturers from the Faculty of Education at University of Extremadura were interviewed with the intention of evaluating the teaching proposal. After collecting their opinions and adding a self-evaluation of the intervention, a SWOT matrix was created reflecting the main conclusions. The evaluation determines that there is a need for methodological change in Higher Education.

The general opinion of the proposed intervention is that it strives on improving self-awareness both for teachers and students in regards to the teaching and learning process. It also will help students retain the responsibility for their own learning. All in all, it gives teachers and students the opportunity to implement and operate in collaborative learning activities and self-organized tasks in higher education.

JUSTIFICATION.

The birth of the new millennium and the development of new and better technological hardware and software has produced a shift in the way society lives. Humanity now lives in a technological era and interacts within a society of information. The arrival of ICT's and the opportunity to access information from any place at any given time provides students with the modalities to develop new ways of learning and using knowledge both in formal and informal contexts, in other words, inside and outside of the educational institution. During recent years, training trends have been growing in parallel to increasing learning possibilities. Gutiérrez and Peart (2014) state that many authors confirm that there are new emerging ways of learning. In fact, a new learning culture is arising, which is breaking classic boundaries of teaching within formal education. With this, lecturers are witnessing the birth of new learning approaches that dissolve the Tayloristic view of schooling institutions. This provides learners with the opportunity to learn at any place and at any time (everywhere&everytime learning: EEL), that has shifted the emphasis from 'Formal Schooling' to the "Do–It-Yourself" (DIY) Paradigm (Gutiérrez and Mickiewicz, 2013).

At the same time educational scholars argue that teaching practices need to be student-centred. Ausubel is well-known by his proposal of learning by discovery. This process details how discovery or problem solving methodologies are the chief means of transmitting subject-matter content. Moreover it is necessary for students to engage new course content with prior existing knowledge, thus building on them with new ideas (Ausubel, 1962). The constant relationship between previous knowledge and content to be learnt needs to be enhanced by teachers by using engaging activities that aid in the development of lifelong learning skills. Much of the world is discoverable, which is how all children learned from the time they were born until around the age of entering formal education. Once learners enter formal education their learning is assumed to be different and is delivered differently almost solely through being instructed by people and soon after by books as stated Nicolas Negroponte (2012). To put it another way, teaching practices need to be student-centred and not spoon-fed by teachers. A way to achieve this is through the use of learning environments and technology-enhanced

classrooms. However, teaching staff need to take caution as the mere integration of ICT does not imply an evolutionary change, as the methodology of many teachers remains similar to that of traditional methods of schooling. Furthermore, interchanging the chalk for a digital pen and a chalkboard for smart-boards does not mean that teaching is evolving. This just underlines the fact that technology is improving. Educators have to focus on changing their teaching methods in order to be able to keep up with societies needs and prevent standards from declining. As pointed out by Area (2012), studies and research show that the great majority of teachers tend to use technology to the same extent as traditional activities (in a deductive and repetitious way). In other words, new information and communication technologies are incorporated into the classroom, but they are used under an obsolete traditional teaching model. This statement highlights that teachers must be trained and be able to apply the method, underlining once again the eventuality that today's teachers lack the training and resources in ICT. IT tools are being used to change the interface of education, however, it depends on teachers to update the operating system of teaching.

AIMS OF DEGREE DISSERTATION.

The main aims of this degree dissertation, that have been elaborated in order to measure the effectiveness of the teaching proposal discussed, are the following:

I. To provide and promote an innovative alternative to teaching methodologies for Higher Education by using collaborative tasks with ICT tools.
II. To propose renewed teaching practises in Higher Education and in initial Teacher Training.
III. To design an intervention proposal for Higher Education within initial Teacher Training introducing Problem-Based Learning methodology.
IV. To promote Lifelong Learning Strategies in Higher Education by using Problem-Based Learning methodologies through Self-Organised Learning Environments.

CHAPTER ONE: THEORETICAL FOUNDATION.

1.1. Implementation of ICT tools in teaching.

"Every country on earth at the moment is reforming public education" [Robinson, 2010]

This statement from Sir Ken Robinson (2010) illuminates the fact that today's education system and methodologies are beginning to lose effectiveness. The Industrial Model of Society or the *Tayloristic* view on which the schooling system is based is changing. The forthcoming of the new millennium supposed a radical shift in values in the way people communicate and set about achieving goals. A key factor in this evolution is technology, which is producing not only instrumental changes but is also influencing the way students reach learning goals. Moreover, the profile of students is also being rewritten as the flood of information that can be found online and the ease with which learners can publish and communicate through social networking platforms is defining a new type of learner.

To highlight the trends of this emergent generation in regards to the use of technology and cognitive processing, several authors have used different terms such as Millennials (Howe and Strauss, 2000), Digital natives (Prensky, 2001 and 2010), Knowmads (Moravec, 2008) and New Millennium Learners as created by the New Media Consortium and Educause (2010). Howe and Strauss (2000) explain how Millennials are the first generation to be engulfed in digital media and collaborative activities (such as: peer-to-peer communication) and to manage their own knowledge. Said authors detail the changing ways that members of this generation learn, communicate and entertain themselves. Other researchers such as Oblinger (2005) indicate that Millennial Students work together, using technology to interact and seek out information in addition to applying novel approaches to resolving the problems of today.

In parallel, Prensky (2001, 2007 and 2010) along with other researchers defined the concepts of digital natives and immigrants. Firstly, Prensky states that students have changed radically and are becoming less and less identified within the educational system. In other words, students are no longer the people our educational system was

designed to teach to, due to the arrival and rapid dissemination of digital technology in the last decades of the 20th century.

Digital natives can be defined as the students who are “native speakers” of the digital language of computers, videogames and the internet. That is to say, those students who were born in the ‘digital world’ and are able to receive and process information quickly and those who can multi-task and network. On the other hand, those people who were not born in the digital world but are willing to learn, thus, integrating themselves into the new era of society are called Digital Immigrants.

Another profile was defined by Moravec in 2008, these new learners are named Knowmads. The main idea of this profile is that learners are working nomads of knowledge and innovation. This concept is attributed to a person who is innovative, imaginative, creative and able to work with any person, in any place at any time. Nowmads, like in the past, have an inherent capacity to configure and contextualize the work space, as their constant movement provides new life opportunities.

Along with Millennials, Digital Natives and Knowmads, New Millennium Learners (from hereon, NML) are based upon two fundamental principles. The former stating that NML lives are centred round technology and are highly dependent on ICT. The latter addresses the extent to which social-cultural practices have suffered due to the way digital media has altered society. The implications in the teaching and learning process is more evident, as students are not only accessing, managing, creating and sharing knowledge in dramatically different ways as their teachers often do, but also have radically new expectations regarding what a quality learning experience should be. In order to be able to teach these new learners, educators need to reflect on how to teach both legacy and future content in the language of the digital natives. To do so, the first major task is to translate and change teaching methods; the second involves new content and thinking. To sum up, teachers have to create New Millennium methodologies for all subjects, at all levels, using students as a guide and epicentre of training. Furthermore, universities need to appreciate that the profile of new students is evolving. This new generation uses technology in their everyday life and in learning

contexts. Thus, we need to adapt teaching methods to address the constant changes of society, of students and the way they learn. As a result there are several policies and guidelines that sum up the idea of institutions that pretend to rejuvenate education and focus on the new profiles of future students.

On one hand, national societies adhered to the European Union have to base their ICT and Education policies upon the legal framework established by the European Council. The European Parliament and Council in 2006 provided a definition for digital literacy according to which, digital competence involves the critical and secure use of technology from the Society of Information for work, leisure and communication, building on basic ICT skills: use of computers to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet. In other words, not only must students be able to use the hardware, but must be critical and able to navigate through the vast amount of information available online. In addition, the Common Framework of Digital Competence (2013) also provides a definition for digital competence. The document refers to digital competence as the creative, critical and secure use of information and communication technologies to achieve work-related goals, employability, learning, leisure, inclusion and participation in society. In Spain, the education system and all of its components are regulated by the Organic Law for the Improvement of Educational Quality which entered into effect in 2013. This document states that the profound changes that society faces today requires a continuous and thoughtful adaptation of the education system to the emerging demands of learning. It also highlights the need to create conditions that allow timely methodological change, so that students are an active element in the learning process. Current students have changed radically in relation to those of a generation ago. Globalisation and the impact of new technologies have opened the door for different ways to learn, to communicate, to focus attention or to approach a task.

On the other hand, international institutions such as UNESCO establishes in its ICT Competency Framework for Teachers (2011, p.2) that, modern societies are increasingly based on information and knowledge. So they need to build workforces which have ICT skills to handle information, to reflect and to be creative in order to be adept at problem-

solving so to generate knowledge as well as to enable citizens to be knowledgeable and resourceful so they are able to manage their own lives effectively and satisfactorily. In addition, the framework encourages all citizens to participate fully in society and influence the decisions which affect their lives. UNESCO also states that the document aims “to help learner’s foster cross-cultural understanding and the peaceful resolution of conflict” (UNESCO, 2011, p.2). As underlined in the framework the key stages of Teaching with ICT are centred round a Problem Based Learning (from hereon, PBL). This factor enables learners to solve problems in many contexts as well as develop social, psychological and personal aspects to self-manage and also to critically participate in society. To be able to “build ICT skills” learners must be digitally competent and literate.

1.2. Emerging Learning Scenarios and Lifelong Learning.

"It is a miracle that curiosity
Survives formal education" [Einstein]

Traditionally, the education world has identified three broad learning theories; Behaviourism, Cognitivism and Constructivism. Nowadays, learning is considered to be a way of being (Vaill, 1996). Knowledge is growing exponentially so, in order to counteract the short lifespan that content has, new learning trends have emerged. Taking into account this new legislative and cognitive contexts researchers are making the jump from constructivism to connectivism. Cognitivism often takes a computer information processing model where learning is viewed as a process of inputs, managed by learner's short time memory, to be coded for long-term memory recall. To put it another way, learners create knowledge as they attempt to understand their experiences (Driscoll, 2000, p.376). In contrast, connectivism is an alternate theory that includes technology and connection making. Siemens defines this new concept as "the integration of principles explored by chaos, network, complexity and self-organisation theories. Learning is a process that occurs within nebulous environments of shifting core elements. This ideal is driven by the understanding that decisions are based on altering foundations" (Siemens, 2005, p. 5) This means that new information is always being acquired, thus the learner needs to establish networks of knowledge based on information sets.

The dawn of the new millennium and the technological transformation has caused a considerable change on the way we live, on our customs and on our social habits. The new stage of life is founded on the ease of access to the "society of information". While school is the institution that collects the desires and the social demand for building their future taxpayers, in theory it should evolve with society. However, the mere integration of ICT does not imply an evolutionary changes as the teaching methodology of many teachers remains similar to that of the twentieth or even the nineteenth century. According to this new social, economic and cultural scenario, the development and infrastructure improvement led to the emergence of a new set of technologies used in

distance learning specifically in Virtual Learning Environments (VLE), primarily through the so-called virtual platforms or 2 LMS (Learning Management Systems), with the inclusion of particular online modalities for training (b-learning, e-learning and m-learning), where classroom teaching was complemented by virtual spaces for training offered by educational institutions (Mikropoulos and Natsis, 2011).

In the past decade different learning trends have begun to emerge along with increasing learning possibilities. Today's educational horizon is not only limited to the school and education centres but has been widened to any given place at any given time. This means, that a new learning culture is arising, which is breaking the classical teaching boundaries of formal education. This new tendency bases itself on the use and integration of technological tools (new devices and tools, hardware and software) and teaching innovation (new learning and teaching methods, new ways of using devices and tools for teaching and learning). With this, we are attending to the birth of new learning approaches as stated Beetham, McGill and Littlejohn (2009). Formal, informal, online, lifelong learning and the new-born ideas, such as edupunk, edupop, incidental learning, ubiquitous learning, among others. All these pedagogical trends address the key idea of introducing ICT, namely the Internet, into our lives. In other words, connecting students to knowledge and to the world. Thus giving them the opportunity to learn at any place at any time. (everywhere&everytime learning: EEL). We can also point out that this is another way of levelling the playing field in order to provide students with the same opportunities and knowledge enrichment, regardless of their background. In addition these new tendencies shift the emphasis from Formal Schooling to the Do It Yourself (DIY) Paradigm (Gutiérrez and Mickiewicz, 2013). This mind-set is setting the coordinates for developing the lifelong learning strategies of learners.

All of the previous ideals are *learner centred*, this means that all components of the teaching and learning process recognize that the importance is on the learner (not just children) and the knowledge, thus focusing on the learner and the process of learning itself (Crick, 2006). This author also goes on to state that when we integrate variables such as attainment or development we begin to harness *learning power.* The concept of Learning Power is an abstract concept that McGettrick (2012) explains using the double

helix of learning metaphor. The author explains how a DNA molecule has two strands which run parallel to each other. Crick et al. (2006) suggest that teaching for learning has also got two stands. On the one hand there is a strand attending to personal development of learners and on the other, there is another strand which represents the knowledge, skills and understanding of the topic. It has been hypothesised that both strands are held together by learning power. It is said to be the energy that runs through the middle of the helix. Taking this into account the above mentioned authors give the following definition for learning power: "A form of consciousness characterised by particular dispositions, values and attitudes, expressed through the story of our lives and through relationships and connections we make with other people and the world". (Crick, 2006, p. 59) In other words, Learning Power is said to be a form of consciousness that is inherent to all human beings, that is expressed within and between human people. It is about thinking, feeling, wanting and doing. The same authors define seven dimensions in which learning power can be recognized, these seven dimensions are also the same dimensions measured in the ELLI Project Inventory.

The questionnaire that researchers of the ELLI Project have created and validated contains seven dimensions. The dimensions of learning power are introduced as the emergent pole of the research which tends to be positive and the contrast pole tends to represent the negative that inhibits learning (See table one).

Dimension	Main Pole	Contrast Pole
Creativity	Creativity	Rule Bound
Growth Orientation	Changing and Learning	Stuck and Static
Critical Curiosity	Critical Curiosity	Passivity
Meaning Making	Meaning-Making	Fragmentation
Dependence and Fragility	Dependence and Fragility	Resilience
Relationships / interdependence	Relationships / interdependence	Dependence or Isolation
Strategic Awareness	Strategic awareness	Robotic

Table 1: The list of dimensions of Learning Power (Crick, 2007)

The following paragraph specifies the variables of each of the dimensions of the ELLI questionnaire.

Growth Orientation This dimension focuses on the sense of changing and growing as a learner. The positive pole being changing and learning, in contrast the negative pole reflects being stuck and static.

Critical Curiosity. This dimension focuses on the inclination to ask questions, to get below the surface of things and come to conclusions. The positive pole is being critical and curious and the negative reflects a learner's passivity.

Meaning making. This dimension encompasses making learning personally meaningful by making connections between what is learned and what is already known. The positive pole caps the meaning making process and the negative pole represents the fragmentation.

Creativity. This dimension includes the following activities and constructs: Risk taking, playfulness, lateral thinking and using imagination and intuition in learning. The positive pole of this dimension is being creative, in contrast the negative represents being bound by the rules.

Learning Relations (Relationships / interdependence). This dimension represents the ability to learn with and from other people and to learn on my own. The positive pole relates to interdependence and relationships. Meanwhile the negative pole represents isolation and dependence.

Strategic Awareness. This dimension represents the learner's awareness and actively managing their own learning feelings, processes and strategies. The positive pole defines being strategically aware of you actions, whilst the negative pole represents being robotic.

Dependence and Fragility. The definition provided by the ELLI research team for this dimension construct is the positive pole would entail dependence and fragility but on

the other side, the negative pole would embrace resilience. Resilience is “the tenacity to persist in the face of confusion, not knowing and failure” (Crick, 2006. pp-80-89).

This Research analysis tool would be applied before the beginning and at the end of the course in order to guide teachers towards the best methodology to use with the aim of increasing students learning power and lifelong learning skills. As researched by Crick (Crick, 2006) The ELLI Learning power profile gives students and teachers the opportunity to improve and enhance learning scenarios and capacities but assessing the data obtained from the inventory. In addition to explore how learning power relates to other influential elements of learning (Crick, 2006). Meanwhile, there is another concept that can be defined when using data to optimize the learning process. Learning Analytics is defined by Brown and EDUCAUSE (2012) learning Initiative as the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimizing learning and the environments in which it occurs. As a genre of analytics, learning analytics (LA) uses these methods to achieve greater success specifically in student learning. Learning Analytics can be used in a variety of ways, some of which include alerting faculty, students, and advisors when intervention is needed; providing input for continuous improvement in course design and delivery; or management of personal knowledge networks and of learning environments.

As summarized by Alavi and Leidner (2001) knowledge management is largely regarded as a process involving various activities. At a minimum there can be four basic processes of creating, storing/retrieving, transferring, and applying knowledge. These researches also go on to add that these divisions can be specified further, into creating internal knowledge, acquiring external knowledge, storing knowledge in documents versus storing in routines (Teece, 1998) as well as updating the knowledge and sharing knowledge internally and externally. In other words, Knowledge Management is the process of capturing, developing, sharing and effectively using knowledge. It refers to a wide range of disciplines becoming interlinked in order to achieve learning goals by making the best use of knowledge thus creating personal learning networks of information. These networks can be shared by students in a range of learning environments.

Rodrigues and Lobato (2013) define Personal Learning Environments as personal spaces of learning mediated by technological artefacts that related external knowledge with others that are connected to the Web 2.0 space. They are directed by personal rules that form and where multifaceted information is to be shared, improved and established as a common good. Although the implementation of educational processes from and for a PLE is not produced by the action of the tools in use and activities developed, but of the teaching strategies used to achieve new learning (Urbina et. al., 2013). As synopsised by Gutiérrez & Peart (2014) Personal Learning Environments are a new learning focal point that eases the acquisition of the digital competence, recognising the existence of a permanent personal learning environment (Adell & Castañeda, 2010), constructed and shared by other people that are part of our open, interoperable, personal, professional and social environments under control of the learner, not the teacher or the institution (Area & Adell, 2009).

Another emerging Learning Environment is the Self-Organized Learning Environment which is considered by Mitra and his colleagues as a self-organising system in which a structure appears without explicit outside intervention. Within such a system, critically interacting components self-organize to form potentially evolving structures that exhibit a hierarchical order from an emergent system. As Mitra illustrates, there are many examples of such self-organization: flocks of birds, lines of marching ants, rhythmic applause. Self-organizing systems can operate with a few simple rules to produce patterns. When an audience claps continuously for a long time, the clap starts to come together in a boring, rhythmic kind of way, as if there were a conductor waving his baton and saying, clap, clap, clap, only there is no conductor. The sounds of the claps self-organize, and the rhythm is emergent. In addition, Dolan (2013) defines self-organised learning environments as models of learning in which students self-organise in groups and learn using a computer connected to the Internet with minimal teacher support. A teacher encourages their class to work as a community to answer questions using computers with Internet access. The magic sparked by the SOLE experience emerges from fascinating questions igniting student's curiosity. We have found that large, open, difficult and interesting questions often make the best questions for SOLE inquiries (Mitra, 2010). Nobody tells the students how to do the job they just start doing it in the

way they seem fit. Thus, learning becomes the emergent phenomenon. Self-organised learning environments' are created when educators encourage learners to work in groups in order to answer motivational and curious questions. To do this there are certain parameters that should be met in order to create proper operation settings.

First of all, students should choose their own groups. However, pupils can look to see what other groups are doing and take that information back to their own groups. Learners are free to change groups and to move around freely. They can talk with each other and discuss with other groups. Second of all, in order to successfully undertake a SOLE activity, educators or monitors will have to practice teaching the curriculum or the course content through questions and in time they will get better asking questions. When progressing with the methodology teachers will become more in tune with what children are most interested in, as they are interacting all day with their needs. As a result they will feel connected on a more equal level and will expand their own understanding of what children can learn on their own. Finally, in a school or in the higher education centre seminars or workshops, they will have to promote a learning environment that encourage students to learn independently. So to, promote independent free thinking and learning. They have to create a culture of curiosity and self-driven learning thus developing experience in more invigorated and interesting classroom activities. Most importantly, workshops offer more opportunities for both independent and collaborative thinking.

With this mind-set, we hope to achieve a learning environment in which learners can pursue curiosities and learn either individually or collaboratively. Implementing a SOLE in the teaching-learning process should create a positive ambience in which learners are given the tools and the opportunity for Lifelong Learning.

CHAPTER TWO: TEACHING PROPOSAL.

2.1. METHODOLOGICAL DESIGN.

This section deals with the proposed methodological design (see figure two) to be implemented in the IT, Research and Teaching Resources subject. The subject is embedded in the study plan of the first year of the Primary School Teachers Degree at the Faculty of Education at the University of Extremadura.

In order to understand the moments of the teaching proposal there must be a distinction between operation levels. The timeline hierarchy is as follows, the main moments of the proposal are called stages. The second level moments are called phases and the last hierarchy levels are called steps. In other words, inside a stage there are different phases and a phase can be subdivided into steps.

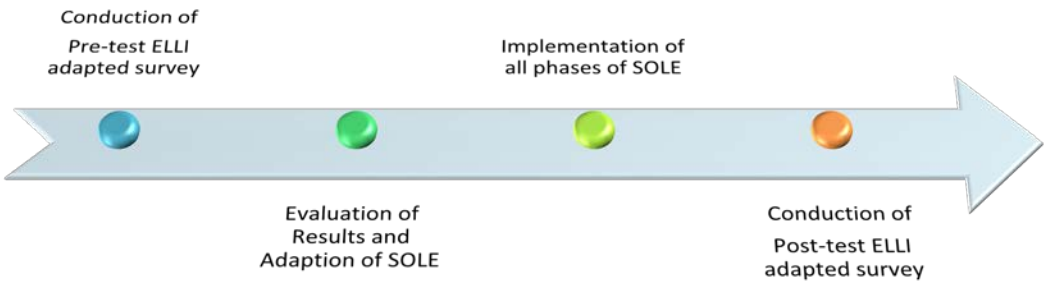

Figure1: Stages of Methodological Design

The first stage of the methodological design is the conduction of the Pre-Test using the adapted ELLI survey. This first stage is conducted before the course initiates in order to discover the new-entry university student's (or an adapted version for younger students) lifelong learning and learning power profile. In order to conduct a previous analysis of the data and being able to understand the strengths and weaknesses of future students. The second stage of the proposal consists in the evaluation of results and the adaptation of the SOLE. By taking into account the data retrieved from the previous stage, teachers can optimise the SOLE environment making the necessary adaptions to favour the learning power profile of students.

METODOLOGICAL DESIGN LAYOUT SCHEMA

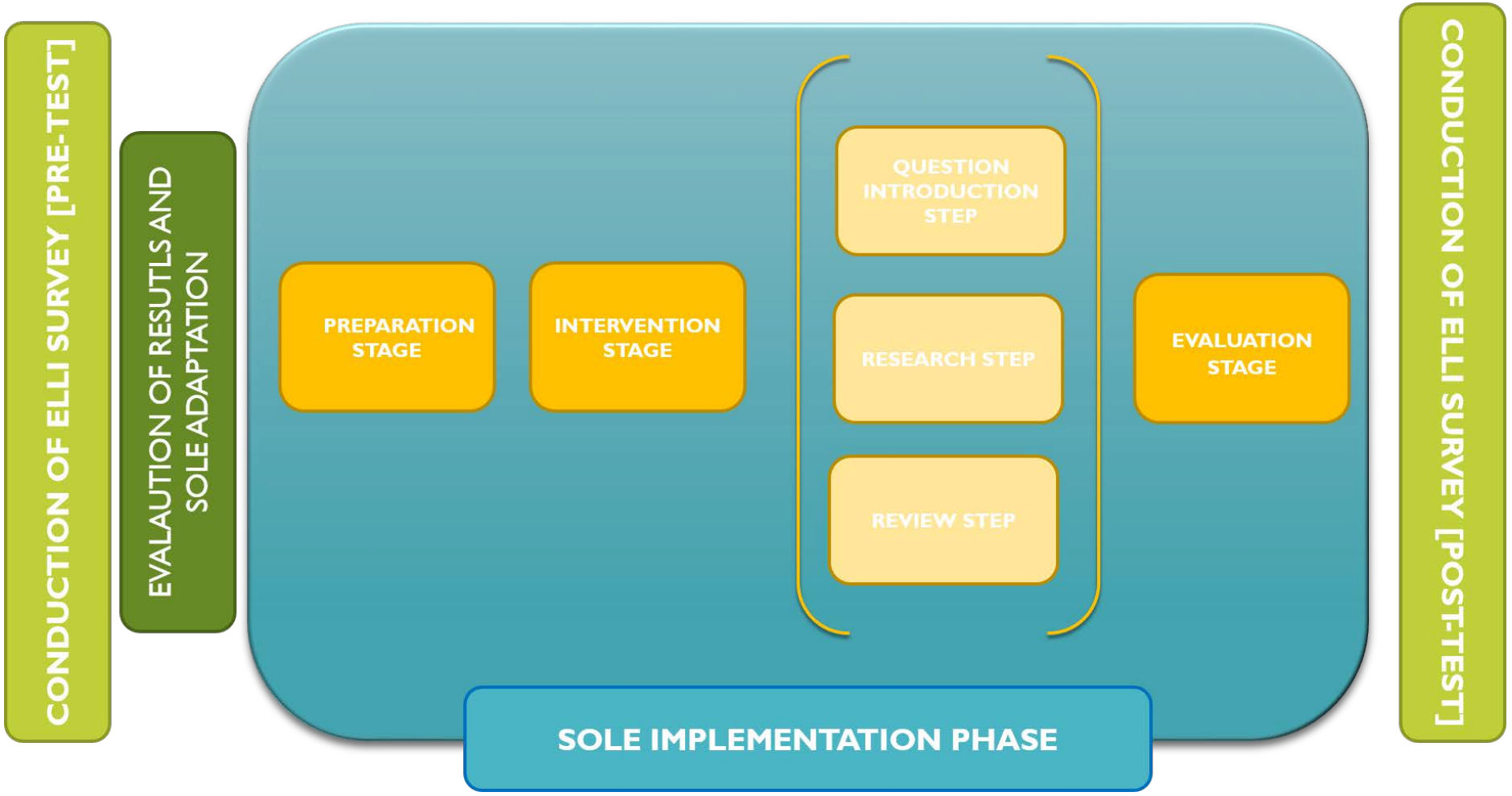

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Figure2: Methodological Design

The third stage of the teaching proposal emends the conduction of the SOLE session, which itself is divided into three phases, which will be explained in the following paragraph. The implementation stage includes the development of the SOLE Session. The final stage, which is only accessed after the completion of the phases from the intervention stage, is the moment in which a post-test is conducted. This stage is carried out at the end of the course. Its objective is to contrast new-entry university student's initial and final Learning Power profile. This contrast of data will also provide researchers with evidence to whether or not SOLE implementation in the chosen educational level is useful to promote Lifelong Learning.

As commented previously, there is a three-phase division of the SOLE implementation stage. As explained in the image below the stage is divided into three sub-phases. The first phase is named the preparation stage, where teachers and researchers must prepare not only the classroom and infrastructure spaces but also, the course content in form of big, curious and open questions. The second stage is the intervention stage in which the lecture works with the class and conducts the SOLE session itself. This stage is also subdivided into three steps, which will be explained afterwards. The final phase of the SOLE implementation is the evaluation phase, where lecturers and student must complete a SWOT analysis about their perspectives on SOLE sessions and its related methodology.

Figure 3: Phases of SOLE implementation

As previously stated, the intervention stage is divided into three steps (see figure 3). The first step of the intervention stage is called the Question Introduction Step, where the lecture engages student's previous knowledge. It also necessary in this step to ask

students to divide into groups and gather round a computer. They will be also asked to distribute tasks and inner-group roles among themselves. In other words, the teacher has to explain the process of SOLE and then encourage students to distribute the roles of management and control (as in a SOLE session, student self-organize and regulate). Once the groups are ready, the teacher submits the big problem in order to arouse the curiosity of the students and ignite their desire to discover. This step should not last more than ten minutes, with groups and roles established the process of teaching and learning begins with the question. An example of an IT, Research and Teaching Resources subject question could be: *How would life be without technology?* (Explained in the section below).

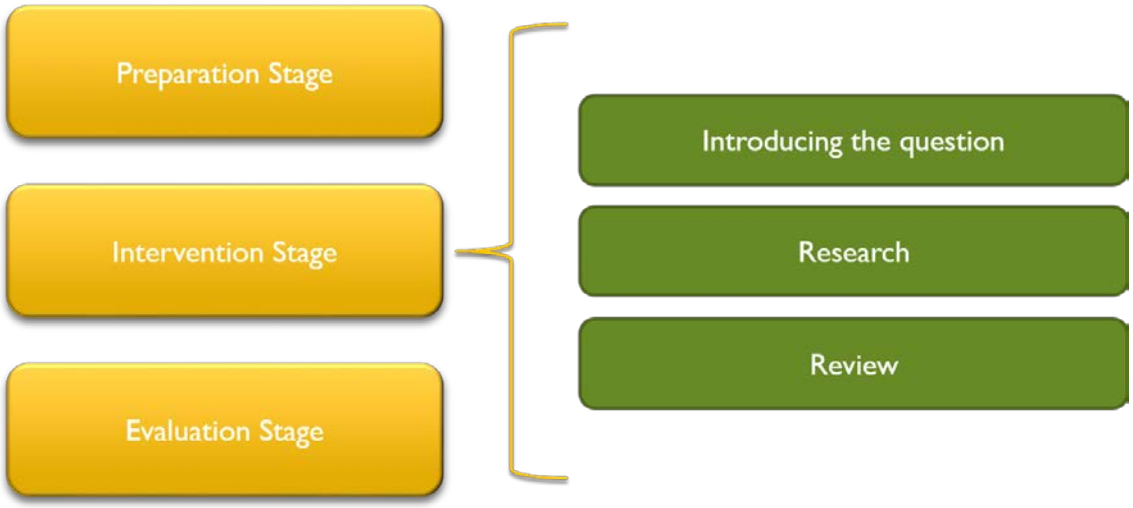

Figure 4: Steps of the SOLE intervention Phase

The second step of the intervention stage is named the *research step*. Students have to research and use ICT in order to answer the question that has been introduced in the previous step. It is necessary to point out that the discipline or the theme of the answer of groups will vary. Basing their work on the design elaborated by Mitra (2010) and afterwards by Gutiérrez and Peart in 2014 state that in this step, the students have to start the academic adventure. In small groups, they begin the research step. Students must locate, analyse and gather the information they consider necessary to resolve the problem. They have approximately 30 minutes. In the above example, students now seek the influences of technology in modern life, its functions, and so on. In order to

respond adequately to the question they would have to come up with their justified conclusions about what life would be without technology. This question can be pursued by various discipline branches (when we have more groups or the more flexible the question, the more likely we are to have a variety of responses). While perusing the information to answer the question, members of the group must document their progress and findings via Twitter. All groups will share a live feed to a common blog in which all content and information will be shared and stored integrating web 2.0. activities.

The third and last step of the intervention phase is so-called the *review step.* This should take place in a big group area, in which each group presents their findings summarizing what they have learned and their own conclusions. This step could generate a debate on the subject or the information collected. At the end of the session, the students should reflect on what they have done in the SOLE and what to improve (both learning and behaviour). It should last about fifteen minutes. This introduces students to a conference themed environment which increases their synthesis and oral production capacities.

In conclusion, this constitutes the general basis as a guideline for the implementation of this proposal. In the adjoining sections we can see a more detailed description of the proposal.

2.2. OBJECTIVES.

When we conduct the Self-Organised Learning Environment in the previously mentioned educational centres, as educators we strive:

- To design Self-Organised Learning Environment activities in Higher Education according to students' profile.
- To use the Effective Lifelong Learning Inventory, in order to define the learning profile of students in Higher Education.
- To make an alternative collaborative learning proposal for Higher Education.
- To collect students and teachers' views and opinions about other types of training that depart from the prevailing models today.

2.3. ACTIVITIES.

The changing of the traditional methodology to Self-Organized Learning Environments sessions promotes the acquisition of mainly, the Digital and the Learning to learn competence. However, having said that, it also can promote any of the other competences (basic, specific and cross-curricular) depending on the content questions. By changing the standardized method of a class, teachers are developing student's research skills, as they have to use the Internet in order to find, criticize and filter information to answer a syllabus question. In addition to creating a presentation about their findings, students must also document their progress through a live Twitter feed that relays to a class blog. So, in summary students from the very beginning are surrounded by technological tools that are going to form part and aid in their learning process. Thus, contributing to their acquisition of their digital competence.

As explained in previous sections, students are free to make decisions about how to face the task. By giving learners the opportunity to plan their own learning process and to select the information that they find relevant, teachers are helping students manage

their knowledge. As a result they are learning to learn, as well as acquiring the chosen content knowledge from the specific SOLE session.

The main researcher of reference for Self-Organized Learning Environments in Primary Education is Sugata Mitra who in his published documents provides a compilation of questions from world-wide research; for instance: *Is life on earth sustainable?, Why are children forced to fight* [about child soldiers in Africa], *Will robots be conscious one day?, Do fish feel pain? Is the candle melting or burning? Where does language come from?* And so on. In order to describe in full the proposed methodology, the following case study is based upon the curricular content of the "IT, Research and Teaching Resources" subject question: *How would life be without technology?.* Not only does this session strive to develop digital and learning to learn competences but also can aid in the specific competence detailed in the study plan of the course and subject. In this particular case the cross-curricular competence CT1.3C which states that students have to use technologies as an intellectual work instrument and as an essential element to inform, learn and communicate.

The first stage of the SOLE implementation is to prepare a question and set the scene for learners, this would include creating the question to drive student's curiosity towards the possible answers, as well as adapting the space in order to carry out the SOLE Session. Mitra (2010) stated that the question is possibly the most critical aspect of the session. He also gives the opportunity to begin the session with a story in order to draw student's attention and gives an idea of the previous knowledge and alternate ideas that children may have. In addition to creating the question we must also adapt the environment to facilitate the SOLE session. For this Mitra suggests making groups of four students with a wide-screen laptop or computer. Moreover it would be best if the classroom was completed with movable furniture and writing walls. Before beginning the session teachers need to lay out the *ground rules*, these are:

- Make groups of four.
- Each group can use only one computer/laptop between four children.
- Students can move groups, consult peers and invite the collaboration from others.
- There must not be any intervention by teachers. Teachers' and other adults in the room need to be *'invisible'* for the duration of the session.

Once the first stage is complete, it is time to move on to the implementation stage of the proposal which is divided into several steps. These steps are:

a) Question Introduction Step.

As commented in the previous section, the question that is to be used in this case study is: *How would life be without technology?* Teachers can also include a short introduction story to set the scene and evoke knowledge. In this case we can delve into the many realms of cinematics or even by asking students to relate to their childhood, to see if they can remember a time without technology.

b) Research Step.

The research step entails looking for information in order to answer the provided question. Before letting the students begin to answer the question, students need to select democratically a manager to keep the group on track as well as to supervise the progress of the team. The only means of contact between the teacher and the group will be through the manager.

As stated in previous sections, during this research stage students have a set amount of time in which they have to research possible answers for the question in full. To do this, they have to implore all of their previous knowledge and competences. Meanwhile the group has to publish their findings via a twitter feed to a blog. Thus, teaching students that social media and personal knowledge networking can be used to aid education.

Once concluding children need to prepare a presentation about findings, using whatever material they have found and filtered. In the selected case, students will be directed towards the importance of technology and different theories about its use and dependence.

c) Review Step.

The final step of the intervention phase is the *reviewing step* in which learners are going to share their findings with each other. This brings a combination of humour and seriousness as probably all of them will have been looking at each other's work, which is the basis of scientific research and collaboration, as stated by Mitra. Moreover, participants can use the blog or the twitter feed in order to explain the procedural approach to problem solving.

In this scenario, the teacher, once again, becomes available and announces the time that each group has to present their work. It is a good idea to give them a little time to prepare and the opportunity to put their thoughts together to then share in the forum or final conclusions in with the whole group. As the leader of the forum or mini-conference teachers can take this opportunity to build on the answers provided to connect with the finding of other groups or to provide small additions of information. To finish the session it is always a good idea to ask them for feedback in order to check what they will remember and why.

In regards to the evaluation process in a SOLE scenario, we can say, generally speaking, that standard tests are administered in every subject via the same pen and paper format, with the aim to find out how much of the content students have learnt. As said in previous chapters, the horizons of education are expanding and in light of the changing paradigm of the education process, we must also take into account different ways to assess and evaluate students. For implementing SOLE and related learning methodologies we propose to follow national guidelines and continuously assess participant learners.

d) Session Evaluation.

As teachers do not intervene much during the SOLE sessions, they are free to observe what and how learners are doing. In order to quantify the participation and the work of learners in the research step of the SOLE, we can use a rubric (see proposed rubric in appendix II). We can also take it one step further and provide students with a rubric for the review stage; in which they would have to mark student's performance both in selecting the information as well as their and ability to present the researched information (see appendix III). In addition to both rubrics, the teacher can ask students to create a portfolio of all of the questions of the SOLE. Thus, obtaining another source of information to be able to judge on academic and personal improvement.

With respect to the evaluation of the SOLE methodology itself, we can contrast the information from the PRE and POST tests of ELLI (described in the previous chapter), with the intention of viewing if the teaching methodology used has encouraged any change in a student's learning profile. In addition to this information we can also extract the learning analytics data from within the computer program, in order to collect data on searching patterns and thus being able to better teacher's explanations predicting future learning outcomes of students.

Finally, we can also obtain data by consulting students and teachers on what Strengths, Weaknesses, Opportunities and Threats do they find when participating in a SOLE session; by doing so we can assess our own the proposal having used a SWOT analysis, receiving the qualitative and quantitate data necessary to optimize the learning process.

2.4. RESOURCES.

In order to implement a project or, as in this case, a teaching proposal certain resources have to be allocated to optimize the intervention. In first place, before conducting the SOLE session, teachers needs the Effective Lifelong Learning Inventory (ELLI survey), with the intention of extracting the learning power and Lifelong Learning profile data of new-entry students. Due to the complexity of the survey and the size of the sample it would be preferable to obtain the computer based version. In addition to the survey, teachers will have to create an online blog or similar site as well as the Twitter accounts. Once both are created the educator needs to establish a live feed between them. Finally, in the preparatory stage of the process, teacher must transform their existing syllabus into a barrage of curious questions that spark students desire to uncover the multiple answers.

As stated in previous paragraphs, students must self-organize into small groups and each group requires a computer with Internet access. All of these devices must be fitted previously with Leaning Analytics software as to give teachers feedback on student's online actions. As well as the software we have also commented the importance of using various assessment and evaluation tools. These must also be prepared beforehand.

In regards to the classroom infrastructure itself, we can point out that as teachers are implementing collaborative learning tasks in the SOLE session the furniture has to be suited to this purpose. The classroom material must be mobile and easy to redistribute as in the SOLE there is a lot of movement. Finally, to aid with the idea stated previously, students who participate in the SOLE are required to connect strands of information together and manage their own learning. For this, learners will need writing material, preferably entire wall panels of whiteboard so that the whole group can brainstorm and view the full horizon of the tasks.

2.5. EVALUATION OF THE TEACHING PROPOSAL.

As to provide an initial SWOT analysis of the perspectives and views of a selection of lecturers at the Faculty of Education, University of Extremadura (Spain) a sample was selected and interviewed. The process began with a brief contextualization of the Degree Dissertation and the core aspects of the theoretical foundation to the teaching proposal followed by a detailed summary of the suggested teaching methodology. After which, there was a short question and answer period to solve any doubts that participants may have. Finally, the interviewee's were asked six questions, which were:

1. In general terms, what did you think of the teaching proposal?
2. Do you think it is appropriate for Higher Education? Why or why not?
3. What positive and negative aspects can you find to the proposal?
4. Can you identify the strengths and weaknesses of the teaching proposal?
5. What do you most like about the proposal? And the least?
6. In your professional opinion, if you were to conduct this in your lectures what results do you think you would obtain?

A written log documented the answers of the participants, with them and a self-assessment from the author, a SWOT Analysis matrix was designed (see table 2). A SWOT matrix is a situational study method of a collective in their environment relating them to the internal characteristics in order to determine possible lines of action to accomplish set objectives. (Trujillo, 2010, p.1).

Ponce (2007) establishes a difference between internal and external elements. The internal elements are Strengths and Weaknesses related to the project itself and he defines them as:

- Strengths: are the valued resources of the project and what is correctly done. They are said to provide a favorable situation for the project. (Ponce, 2007, pp.114-115)
- Weaknesses: are the factors that make the project vulnerable or deficient (Ponce, 2007, p.115)

The external elements defined by Ponce (2007) are external to the environment (in this case, to the teaching proposal). These elements are defined as:

Opportunities: Represent the external environmental factors uncontrolled by the organization and represent the positive aspects and potential growth. (Ponce, 2007, p.115)

- Threats: the opposite to the opportunities and represent the sum of the uncontrolled environmental factors. They represent the negative aspects and potential problems of the project. (Ponce, 2007, p. 115)

In educational contexts, this tool is widely used in order to evaluate forthcoming teaching proposals and to assess educational projects. We have decided to use a SWOT analysis as to document the different perspectives of faculty staff and at the same time we have contributed to the broadcasting of this means of project evaluation among the faculty staff.

2.6. RESULTS.

The results of the personal interviews with teachers from different content areas and experience of the Faculty of Education at the University of Extremadura, (For an extended version of the interview notes, please see in appendix I) are presented in this section.

In regards to the first question asked by the interviewer, which was: *In general terms what did you think of the teaching proposal?* We can point out that faculty staff believe that the proposal is very interesting. However, it is subject to many defining variables that could aid or hinder the outcome of the project. Nearly all members of staff that have been consulted have stated that the idea is a great initiative to undertake for Higher Education and would prove to be useful in the modernization of the University. Having said that, some of the subjects declared that there may be initial problems due to the lack of experience from both teachers and students in using this methodology and would take time to settle.

In respect to the second question: *Do you think it is appropriate for Higher Education? Why or why not?* All of the interviewees agreed that it not only is adequate but essential in order to renovate traditional archaic practices. Although some also point out that being so new it could seem very ambitious due to the fact that participants are not used to working and studying in the proposed conditions.

Concerning the third and fourth question: *What positive and negative aspects can you find to the proposal? And can you identify the strengths and weaknesses of the teaching proposal?* The consulted sample of faculty lecturers, on one hand, highlight that it is an appealing initiative as it includes ICT and different evaluation tools, a learner orientated approach to the teaching-learning process. Another positive aspect stated by some members is that students become responsible for their own learning process and begin to work in groups. On the other hand, some lecturers underlined what they consider to be the negative factors, like the fact that the methodology is created thinking that students have basic research and digital skills, as well as experience in working in groups. In other words, they lack the knowledge about methodologies and are not able to be

self-aware about their teaching. Furthermore, some subjects pointed out that this methodology requires more hours of work by teachers, in addition to not being able to count on the minimal infrastructure to adequately develop the SOLE sessions. This particular lecturer pointed out that that although the faculty is equipped with necessary technological devices, they do not suffice to develop ICT methodology proposals. The faculty members also emphasized that the size of student groups could be a negative factor to take into account. One of the faculty lecturers adds two more important issues to take into account. The first being the limitations of Twitter, as it only permits users to publish notifications with a hundred and forty characters. And secondly, there is a correlation between the ways a person works in a group with the influence of student's relationships.

In regards to question five: *what do you most like about the proposal? And the least? W*e must point out that staff reiterated that they find it to be learner-friendly and corresponding with today's modality of teaching. They also refer to previous answers when stating that they find it to be dependent on students' profiles. Finally, question six which asks: *In your professional opinion, if you were to conduct this proposal in your lectures what results do you think you would obtain?* Many answered that that would depend on the interrelations of the group and the profile of students themselves.

SWOT ANALYSIS	
WEAKNESSES (W) – INTERNAL	**THREATS (T) - EXTERNAL**
- Lacks details on how to adapt the SOLE session to Learners' Profiles. - Lacks the design of the assessment rubrics. - The proposal has had no experimental testing. - It is a mere design with no implementation, at present. - Teachers do not possess, at present, the ELLI Survey. - Teachers do not possess, at present, the corresponding Learning Analytics Software. - The proposal does not include details of a training period for students and teachers.	- Existence of multiple and varied student profiles. - The success of the proposal depends on learners profiles. - Elevated number of students. - The uncontrollability of publications in BLOG and Social Media Networks. - The increase in working hours for teachers. - Lack of knowledge and self-awareness of methodologies. - Student's lack of experience in collaborative activities. - Insufficient and inadequate infrastructure at the university (group-work classes, WIFI, sockets, PC…). - Low flexibility of Educational and University Laws and Guidelines.
STRENGTHS (S) – INTERNAL	**OPPORTUNITIES (O) - EXTERNAL**
- Normalizes the use of ICT tools in the classroom. - Eases Cooperative Learning. - Eases group organization. - Promotes students awareness, autonomy and responsibility. - Includes Learning Analytics in Technology Enhanced Learning. - Emphasis is on self-learning and student responsibility of learning. - Learner centered methodology. - Development of student's critical analysis of vast amounts of information. - Demonstrates new teaching methods. - Use of new evaluation and assessment tools.	- Implement teaching proposal in Classes of Master Level (MSc). - Study Plans of the Faculty and University contemplate different types of groupings and teaching situations (Types of Subjects). - The available software would be available for all students.

Table 2: SWOT Analysis of Faculty Staff's perspective about teaching proposal

CONCLUSIONS AND FINAL REMARKS.

The new generations bring with them new ways of living, so as teachers and educators we must be sensitive to the new emerging profiles of students, so being sensitive to their flowering educational needs. New learning scenarios help to configure and describe how new learners learn, think, use and apply technology to their lives. With this proposal we hoped to establish a relationship between formal and informal education in order to develop lifelong learning strategies for young people. By using SOLE and these web 2.0. Integrated activities, students are developing their research skills and their problem solving abilities. Teachers have a duty to prepare students to the best of their ability, and this being in today's society, to cypher information and develop their digital being. Not only do we need to take action by achieving the new millennium objectives for education, but we have to do something more, we are required to provide students with the best opportunities in order for them to fit into this ever growing Digital Society of Information.

In addition to teaching children in the *school of the future*, we must also take a look at how Higher Education Institutions are adapting to the growing demands of globalization and to the digital era. As well as teaching trainee teachers on how they can renew educational practices, it has become apparent that methodologies used in Higher Education need to be brought up-to-date. This educational sector is changing its image, by incorporating more and more online and b-learning courses, by using virtual campuses' as well as researching into specialized fields. It was the aim of this document to provide an alternative approach to university lectures. In order to do so, we created a teaching intervention project. This project has been assessed by in-service lecturers from the University of Extremadura who point out that it can help students and staff to become aware of the teaching methodologies that they are using. It also promoted a learner-centered education where students are responsible for their learning and finally, it provides the sector with an opportunity to implement and operate in collaborative learning activities and self-organized tasks in Higher Education. Although as previously commented by lecturers, this is a variable that would need to be monitored

meticulously, as it may be counterproductive for a person's growth as a learner. In future investigations this detail will be pin-pointed for research.

It has to be said that there are some drawbacks to the proposal which will be studied and minimized before its trial implementation. In the up and coming years this idea will be set out in more detail and put into practice in Higher Education. Specifically, with trainee teachers, from which data will be obtained to judge if this proposal complies with modern day needs. As well as providing new-entry students with a different perspective of teaching, with the hope that they project it in their placement training and in their classrooms once graduated.

At the beginning of this document I quoted Mahatma Gandhi when he said: "Be the change you want to see in the world" With that we would like to conclude stating that we should stop talking about the *school of the future* and just start designing it. The school of the future is today.

REFERENCES.

Adell, J. & Castañeda, L. (2010). Los Entornos Personales de Aprendizaje (Ples): nueva manera de entender el aprendizaje. En Roig Vila, R. y Fiorucci, M. (Eds.). *Claves para la investigación en innovación y calidad educativas. La integración de las Tecnologías de la Información y la Comunicación y la Interculturalidad en las aulas. Stumenti di ricerca per l'innovaziones e la qualitá in ámbito educativo*. Alcoy: Marfil-Roma TRE Universita degli studi.

Alavi, M. & Leindner, D. (2001). Review: Knowledge Management and Knowledge Management Systems Conceptual Foundations and Research Issues. Management Information Systems Research Center. Available at: http://www.jstor.org/stable/3250961.

Area, M. & Adell, J. (2009). E-learning: enseñar y aprender en espacios virtuales. In De Pablos, J. (coord.), *Tecnología Educativa. La formación del profesorado en la era de Internet*. Málaga: Aljibe.

Area, M. (2012). Enseñar y aprender con TIC: más allá de las viejas pedagogías. *Aprender a educar con tecnología*, 2,0 pp. 1-5.

Area, M. (2012). La alfabetización informacional y digital: fundamentos pedagógicos para la enseñanza y el aprendizaje competente. *Revista Española de Documentación Científica*, Nº Monográfico, pp. 46-74. Doi: 10.3989/redc.2012.mono.977.

Ausubel, D. P. (1962). Learning by discovery. *Educational Leadership*, 20 (2), pp. 113-117.

Brown, M. (2012). *Learning Analytics: moving from concept to practice*. EDUCAUSE Learning Initiative.

Cobo Romaní, C. & Moravec, J. W. (2011). *Aprendizaje Invisible. Hacia una nueva ecología de la educación*. Col·lecció Transmedia XXI. Barcelona: Laboratori de Mitjans Interactius / Publicacions i Edicions de la Universitat de Barcelona.

Crick, R. (2006). *Learning Power in Practice: a guide for teachers*. London: Paul Chapman Publishing.

Dolan, P., Leat, D., Smith, L., Mitra, S., Todd, L. & Wall, K. (2013). Self-Organised Learning Environments (SOLEs) in an English School: an example of transformative pedagogy?. Online *Educational Research Journal*, 3 (11), pp. 1-19.

ECAR (2008). The ECAR study of undergraduate students and information technology. Michigan: ECAR Publications.

Gutiérrez, P. & Mikiewicz, P. (2013). How do I learn?. A case study of Lifelong Learning of European Young. In Eugenia Smyrnova-Trybulska (coord.) (2013). *Theoretical and Practical Aspects of Distance Learning. E-learning and Lifelong Learning Conference*. Katowice: Studio Noa.

Gutiérrez, P. & Peart, M. (2014). Introducing self-organized Learning environments in higher education as a tool for Lifelong Learning. In Eugenia Smyrnova-Trybulska (coord.) (2014 Theoretical and Practical Aspects of Distance Learning E-learning and Intercultural Competences Development in Different Countries. Katowice: Studio Noa.

Ley Orgánica 8/2013, de 9 de Diciembre, para la mejora de la calidad educativa.

McGettrick, B. (2002). The double helix of Learning. In Crick (2006) (coord.). *Learning Power in practice: a guide for teachers*. London: Paul Chapman Publishing, pp. 42-70.

MECD (2013). *Marco Común de Competencia Digital Docente*. Madrid: Plan Nacional de Cultura Digital en la Escuela- INTEF.

Mitra, S. & Dangwal, R. (2010). Limits to self-organising systems of learning—the Kalikuppam experiment. *British Journal of Educational Technology*, 41 (5), pp. 672- 688.

Mitra, S. (2005). Self organising systems for mass computer literacy: Findings from the 'hole in the wall' experiments*. International Journal of Development Issues*, 4 (1), pp. 71 - 81.

Mitra, S. (2010). Self Organized Learning Environment (SOLE). Toolkit: How to bring Self-Organized Learning Environments to your community. TED Prize. Available at: http://www.ted.com/pages/sole_toolkit.

Mitra, S. (2012). *Beyond the hole in the wall: Discover the Power of Self-Organized Learning*. USA: Ted Books Library.

Mitra, S., Dolan, P., Leat, D., Crawley, E. & Kulkarni's, S. (2010). The Self Organised Learning Environment (SOLE) School Support Pack. Available at: https://newsletter.alt.ac.uk/2012/02/the-self-organised-learningenvironment-sole-school-support-pack/ .

Negroponte, N. (2012). Foreword. Learning without School. In Mitra, S., *Beyond the hole in the wall: Discover the Power of Self-Organized Learning*. USA: Ted Books Library.

New Media Consortium and Educause. (2010). NMC Horizon Report. Austin: The New Media Consortium Publications.

Oblinger, D & Oblinger, J. (2006). Educating the Net Generation. EDUCAUSE. Available at: www.educause.edu/educatingthenetgen/.

Pedró, F. (2006). THE NEW MILLENNIUM LEARNERS: Challenging our Views on ICT and Learning. Conference proceedings of the OECD-CERI. Available at http://www.oecd.org/edu/ceri/38358359.pdf

Ponce, H. (2007). La matriz DAFO: alternativa de diagnóstico y determinación de estrategias de intervención en diversas organizaciones. *Enseñanza e investigación en psicología*, nº 1, pp. 113-130.

Prenksy, M. (2007). *How to teach with technology: keeping both teachers and students comfortable in an era of exponential change. Emerging technologies for Learning*. Vol. II. British Educational Communications and Technology Agency (BECTA). Coventry. Available at: http://cmap.upb.edu.co/rid=1GQBR0NVF-Q7X7F6-7PQ/emerging_technologies07_chapter4.pdf .

Prensky, M. (2001). Digital Natives, Digital Immigrants. On the Horizon, 9(5). MCB University Press.

Prensky, M. (2010). Teaching digital natives: partnering for real learning. California: Sage publications.

Recommendation 2006/962/CE of the European Parliament and Council, 16th of December 2006 about the key competences of permanent learning [Official Bulletin: L 394 de 30.12.2006]. pp. 7-8. Available at: http://www.cmepius.si/files/cmepius/userfiles/grundtvig/gradivo/key_competencies_2006_en.pdf .

Robinson, K. (2008) Changing Education paradigms. RSAnimate.available at: https://www.youtube.com/watch?v=Z78aaeJR8no

Rodrigues, P.J. & Lobato, G. (2013). Ambientes pessoais de aprendizagem: conceçoes e práticas. *Revista Latinoamericana de Tecnología Educativa RELATEC*, 12 (1), pp. 23-34.

Siemens, G. (2005). Connectivism: A learning Theory for the Digital Age. International Journal of Instructional Technology and Distance Learning. Available at: http://www.itdl.org/Journal/Jan_05/article01.htm .

Buckingham, S. & Crick, R. (2012). "Learning Dispositions and Transferable Competencies: Pedagogy, Modelling and Learning Analytics". Paper presented at *the Learning Analytics and Knowledge Conference*. Vancouver, British Columbia.

Slechtova, P. (2015). Attitudes of undergraduate students to the use of ICT in education. *Procedia - Social and Behavioral Sciences,* 171 (2015) pp. 1128 – 1134.

Strauss, W., & Hoew, N. (2000). *Millennials Rising: The Next Great Generation*. Vintage Books. United States of America.

Teece, D. (1998). Capturing Value from Knowledge Assets: The New Economy, Markets for Know- How, and Intangible Assets. *California Management Review*, 40 (3), pp. 55-79.

Trujillo, F. (2010). *El análisis DAFO en el diseño de proyectos educativos: una herramienta empresarial al servicio de la educación*. Available at: http://es.scribd.com/doc/37378571/Analisis-DAFO-en-educacion .

UNESCO (2011). *ICT Competency Framework for Teachers*. France: UNESCO. Available at: http://unesdoc.unesco.org/images/0021/002134/213475e.pdf .

Urbina, S., Arrabal, M., Conde, M. & Ordinas, C. (2013). Las páginas de inicio como herramienta de ayuda para organizar el PLE. Un análisis comparativo. Eductec-e, *Revista Electrónica de Tecnología Educativa*, 43, pp. 1-14.

Vaghjee, H. (2014). Assessing the Technological Adeptness of University Students in Mauritius. *Procedia - Social and Behavioral Sciences*, 123 (2014), pp. 63-71.

APPENDICES

Appendix I: Interview Case Notes.

Teaching Proposal Evaluation Interview			
Date	28/05/2015	Place	UEX
Subject Reference Number		INTERSOLE_PROF1 (Male, 38)	
Case Note Reference Number		INTERSOLEDEGREENOTE_1	
INTERVIEWER'S NOTES			
After explaining the proposal to the subject he/she replied that there is a problem with students self-organizing as the correlation between students relationships influence the way each person works within the group. He/she also describes that the use of twitter limits the amount of characters that can be used in a publication. He/she also states that it would be necessary to incorporate channels for teacher-student-student feedback during the process; if not, learners will not know how to improve. He/she later focuses on the importance of the rubric; as it will have to include many categories in order to evaluate the whole process**.** In regards to the methodology the subject stated that there needs to be a trial period in order to verify if the idea is viable. He/she also comments that there is a long distance between the traditional teachers and this methodology, so it may have little effect. The interviewee points out that the lack of knowledge about methodologies and self-awareness of teachers when teaching will hinder the process and a teacher's ability to implement the SOLE. He/she emphasises that self-learning and students attaining responsibility is very positive.			

Teaching Proposal Evaluation Interview			
Date	28/05/2015	Place	UNIV.EXTREMADURA
Subject Reference Number		INTERSOLE_PROF2 (Male, 46)	
Case Note Reference Number		INTERSOLEDEGREENOTE_2	
INTERVIEWER'S NOTES			
PROF2 states that Higher education should be like the proposed methodology. He/she adds that it may be necessary to establish several activities and questions in order to make a comparison between groups. He/she points out that the infrastructure of the University) and in addition the faculty may not be equipped to sustain this type of activity; as during his/her course he/she has had technical problems with the WIFI and other devices. He/she adds that it would be necessary to re-enforce said infrastructure and make the learning analytics software available to students**.** Some positive aspects highlighted by the subject is that it involves cooperative learning and working in groups which aids the educational process. However he/she also insists that self-organization may not be the best form of affronting the task; as they group based on personal relations not learning profile.			

He/she includes that with this methodology it is a difficult to contextualize it in the present guidelines and legislation of the University and the state. He/she concludes by saying that it would be necessary to provide students with a basic guide of the material and then let them work from that and not from zero. He/she states that it is very applicable in higher education and it should be promoted as it develops student's critical analysis and teaches them that there are new ways of teaching and learning**.**

Teaching Proposal Evaluation Interview			
Date	28/05/2015	Place	UNI. EXTREMADURA
Subject Reference Number		INTERSOLE_PROF3 (Male, 59)	
Case Note Reference Number		INTERSOLEDEGREENOTE_3	
INTERVIEWER'S NOTES			
Once having explained the teaching proposal the subject comments from the very beginning that it is not usual to see a quasi-experimental study design in a degree dissertation. He/she comments that the proposal is a good example of how teachers must teach in the future. He/she thinks that it is a good idea to normalize the use of ICT tools in the classroom; and show that they are mere tools for learning. He/she after distinguishes between the positive and the negative aspects of the methodology. Firstly, the interviewee point out that the assessment tools and the use of ICT are very positive as they incarnate the philosophy of the school of the future**.** However he/she points out some negative issues such as; the varied profile of students and other variables like motivation and the context in which the project will be developed. He/she adds that the number of students could hinder the research and would be more equipped in a Master Class and not in the degree. As the number is reduced and the maturation of students is not the same. He/she highlights that the methodology focuses on the students and their responsibility to learn. The subject clarifies saying that the success or failure depends on what the learners learns and what the teacher teaches. He/she includes that a difficulty when using this methodology is that the present faculty staff and the educational system itself does not favour this type of methodology. He/she concludes saying that it is very adequate for Higher Education as it produces a shift from the traditional view towards the school of the future**.**			

Teaching Proposal Evaluation Interview			
Date	28/05/2015	Place	UNIV. EXTREMADURA
Subject Reference Number		INTERSOLE_PROF4 (Male, 57)	
Case Note Reference Number		INTERSOLEDEGREENOTE_4	
INTERVIEWER'S NOTES			
In first place the subject suggests that a SWOT analysis may not be the appropriate evaluation tool. In general the proposal seems interesting to him/her as it is a new trend and very up-to-date. In regards to negative aspects he/she comments that with the proposal we are supposing that all students that arrive at the University have the sufficient and mentality to develop in this type of learning environment. **He/she says that this methodology is very adequate for Higher education as it** includes not only ICT but also new approaches to collaborative learning. He contemplates that the students who have better knowledge will be able to achieve a lot in the SOLE. However those students who don't, will not progress at all. He/she suggests that both students and teachers are lacking knowledge in this type of activities and decrees that this could hinder the methodologies development.			

Teaching Proposal Evaluation Interview			
Date	02/06/2015	Place	UNIV. EXTREMADURA
Subject Reference Number		INTERSOLE_PROF5 (Female, 43)	
Case Note Reference Number		INTERSOLEDEGREENOTE_5	
INTERVIEWER'S NOTES			
The subject suggests that in first place there would need to be a period of familiarization the methodology (for both teachers and students). He/she also comments that we would have to design interventions that prevent students from simply copying and pasting information, and stopping to analyse the information. For this reason the participant feels that learning analytics has to be included. He/she points out that the number of students could be a problem with this methodology also adding that it would be interesting to see how first years develop with this type of activities but underlines the fact that they have a lack of training. In addition to teachers. He/she highlights that there has to be a control when using social media, as students or users do not comprehend the public being of the network			

Teaching Proposal Evaluation Interview			
Date	02/06/2015	Place	UNIV. EXTREMADURA
Subject Reference Number		INTERSOLE_PROF6 (Female, 38)	
Case Note Reference Number		INTERSOLEDEGREENOTE_6	

INTERVIEWER'S NOTES

After explaining the proposal, the subject highlights the utmost importance of creating a goof rubric. He/she also points out that students are not used to working in collaborative learning environments with ICT tools, so primarily there would need to be a training phase before entering the SOLE.

As a positive aspect he/she emphasises the use of learning analytics and as a negative aspect suggests the hours of work that the teacher will have to employ in order to create the materials and analyse all of the data.

He/she points out that the number of students could be a problem with this methodology also adding that it would be interesting to see how first years develop with this type of activities but underlines the fact that they have a lack of training. In addition to teachers.

He/she comments that it is difficult to see how we are going to adapt the SOLE activities to the learning profiles analysed previously. He/she adds that there would need to be a period of familiarization with the methodology (for both teachers and students).

The subject suggest that that SOLE is adaptable to any context and that results would depend on the groups and their profiles. He/she finalizes by saying that there has to be a control when using social media, as students or users do not comprehend the public being of the network.

Appendix II: Proposed Rubric Assessment Sheet for Student Participation in SOLE sessions for Teachers.

RUBRIC ASSESSMENT SHEET FOR TEACHERS.			
EVALUATION CRITERIA	OBSERVED RESULT	GRADE	ACHIEVED SCORE
Participates actively within own SOLE group (1.5 points)	Works actively during over 75% of the SOLE session	1.5	
	Works actively during 50-75% of the SOLE session	0.75	
	Works under 50% of the SOLE session	0	
Participated with other external SOLE groups (1.5 points)	Collaborates and discusses findings with other groups in person and online	1.5	
	Collaborates and discusses findings with other groups either in person or online	0.75	
	Does not collaborate or discuss findings at all	0	
Analyses and Selects required information (1 point)	Intensely Reads and selects core parts of sources	1	
	Lightly skims the text and selects most of the source	0.5	
	Rapidly scans text and selects most of the source	0	
Re-structures information (1 point)	Reformulated text with own words	1	
	Paraphrases text including some comments of his/her self	0.5	
	Directly copies and pastes text	0	
Fully Researches content (1 point)	Researches all concepts or information that does not understand	1	
	Researches half of the concepts or information that does not understand	0.5	
	Does not research or follow-up on concepts or information that is unknown	0	
Discusses Information with peers (1 point)	Discusses and asks for opinions within the group over 75% of the time	1	
	Moderately discusses and asks for opinions within the group (from 50-75% of the time)	0.5	
	Hardly ever discusses and asks for opinions within the group (under 50% of the time)	0	
Participates in information sending and sharing information using web 2.0 tools (1 point)	Sends over five notifications and updates via social networks or blog	1	
	Sends from three to five notifications and updates via social networks or blog	0.5	
	Sends under three notifications and updates via social networks and blog	0	
Respects opinions of other learners (1 point)	Demonstrates a tolerant and receptive posture towards others opinions	1	
	Demonstrates slight fluctuation in behaviour (passive or aggressive) when face with different points of view	0.5	
	Demonstrates a non-dialogue attitude towards group work.	0	
Uses ICT efficiently (1 point)	Uses IT devices and software with ease	1	
	Uses IT devices and Software with minor difficulties	0.5	
	Is not capable of using IT devices and software	0	

Appendix III: Proposed Rubric Peer Assessment Sheet for Students

PEER ASSESSMENT RUBRIC SHEET			
EVALUATION CRITERIA	OBSERVED RESULT	GRADE	ACHIEVED SCORE
Produces fluid discourse (1 point)	Speaker demonstrates continuous and coherent discourse	1	
	Speaker makes minor errors in discourse	0.5	
	Speaker does not demonstrate continuous speech and is not coherent	0	
Is able to express ideas (1 point)	The speaker structures the information accordingly	1	
	The speaker is slightly unorganized when expressing ideas but does not infer in comprehension	0.5	
	The speaker is unorganized when expressing ideas.	0	
Uses ICT tools to aid presentation (3 points)	The presenter uses ICT based presentation tools	3	
	The presentation uses a mixture of presentation tools including ICT	1.5	
	The presenter does not use ICT based presentation tools	0.5	
Has comprehended knowledge content (0.5 points)	The presenter explains the information with own words	0.5	
	The presenter paraphrases the text with help from visual aids	0.25	
	The presenter read the text word for word	0.15	
Answers the Question (4.5 points)	The presentation answers the question of the lesson and all information is relevant	4.5	
	The presentation related to the topic of the question and deviates slightly with extra information	2.25	
	The presentation does not answer the question and information is not relevant.	0	