To what extent are students from Mainland China able to access EBL in a geography classroom in England

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A Research & Development Project

Submitted for the MSc Learning & Teaching 2018

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To what extent are students from Mainland China able to access EBL in a geography classroom in England?

Abstract

Enquiry based learning (EBL) is an influential style of teaching and learning. An increasing number of students from Mainland China are enrolling at independent schools in England. These students are unfamiliar with the creative and open approach of EBL and there is currently little recognition that Chinese students may find it challenging to learn through EBL. The focus of my research was *'to what extent are students from Mainland China able to access EBL in a geography classroom in England?'*

The investigation was conducted over twelve weeks and involved collaboration with a specialist English as an addition language (EAL) teacher. The methods used were teacher led student interviews, action research cycles and finally classroom observations of my teaching practice by the specialist EAL teacher.

Findings indicated that numerous barriers to learning were present. These included lexical, reading speed, confidence, reluctance to ask questions, understanding of spoken language, comprehension of tasks, lack of creativity, unmanageable tasks within allocated time periods and tasks with no prescribed answers. Differentiation strategies were developed and implemented to reduce these barriers. These included key word sheets with images, multiple choice answers, differentiated writing frames which incorporated images, image analysis and sorting activities, anonymous post-it's, flipped learning tasks, partially completed and model answers. A combination of these strategies helped reduce the learning barriers.

Acknowledgements

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1.0 INTRODUCTION

The modern English classroom contains many nationalities and students with different learning needs. It is the teacher's responsibility to support these needs, however as recognised by Moore and Hansen (2012: 45) whilst 'some student differences in learning styles can be accommodated; others are more problematic'. There is currently limited support for teachers on how to assist students from different cultures in the English classroom. Furthermore, the students learning needs are not always easily identified. Supporting students in a culturally diverse classroom is a new demand of teachers, which is often not recognised.

The focus of my investigation was a co-educational independent school, located in the South East of England, which provides education for students aged from eleven to eighteen. The geography curriculum currently being taught is heavily enquiry based. This is particularly the case at Key Stage Three (KS3); where there is less pressure to teach to an examination board's specification and more freedom to develop skills like critical thinking and collaborative working. The adoption of enquiry based learning (EBL) is promoted in the 2014 curriculum in various subjects, where 'pupils should decide on the appropriate type of scientific enquiry to undertake to answer their own questions and develop a deeper understanding of factors to be taken into account when collecting, recording and processing data' (DfE, 2013: 200). It was recognised that the geography curriculum from KS3 upwards should have 'increased involvement in planning and undertaking independent enquiry in which skills and knowledge are applied to investigate geographical questions' (DfE, 2014: 4). In support of Roberts (2013) and Deignan (2009), my teaching practice has taught me that EBL can be

effective in engaging students and enabling them to learn geographical content alongside key skills like autonomy, critical thinking and collaborative learning.

In the last three years, the school has seen an increase in students from Mainland China (here after referred to as Chinese students), which has made teaching through enquiry more challenging, as students are unfamiliar with its creative and open approach to learning. This is not unique to this school as in the last ten years; many independent schools in England have also seen increases in Chinese student numbers. Wealthy Chinese families choose to send their children to school in England, due to the internationally recognised learning standards and the opportunities that having an English education can bring, such as admission into prestigious universities and excellent career prospects. It is possible that this school has received a greater influx of Chinese students due to its close proximity to London, an international city with direct flights to Mainland China. London is also home to the largest Chinese community in England.

The majority of Chinese students arrive in KS3, with the expectation that by the time they reach year eleven they will be fluent in English and flourish academically. Students arriving in England have limited verbal and written skills in English. The majority of students speak Mandarin, with the minority speaking Cantonese. Prior to being given permission, to enroll at the school, students are required to sit an entrance examination, which assesses the level of English but fails to recognise that language is not the only barrier students face when accessing the English education system. All "English as an additional language" (EAL) students attend English support lessons to help them access English language, culture and customs.

There is currently little recognition that Chinese students may find it challenging to learn through western methods of teaching and learning like EBL. This may ultimately restrict students from achieving their full potential. The students' ability to access EBL has been made even more difficult as not all subjects promote it, which means students do not have the opportunity to get used to this method of teaching and learning on a regular basis. This investigation involves collaboration between myself and the EAL specialist in an attempt to identify the main barriers which Chinese students face when learning through enquiry and developing strategies to overcome these challenges. It is my professional duty as a teacher to offer support to these students and differentiate lessons, but at present I am struggling to do so effectively. This has led me to investigate *'to what extent are students from Mainland China able to access EBL in a geography classroom in England?'*

To answer the investigations research question, the following aims were set:

1. *To identify any barriers which students from Mainland China face when accessing EBL in geography*

2. *To develop differentiation strategies which assist students from Mainland China in overcoming these barriers to learning*

3. *To assess the effectiveness of these differentiation strategies*

2.0 LITERATURE REVIEW

2.1 Definition of EBL

EBL was first cited in the 1991 Geography National Curriculum in England and Wales requirements and developed further in the 1995 curriculum. However, it was not until 1999 that geographical enquiry was clearly defined. It is viewed as 'a very important aspect of school geography, and is specified in the National Curriculum Programmes of Study' (Fisher, 2016: 60). From 2007, a strong focus was placed on enquiry at KS3. The coalition government's white paper 'The Importance of Teaching' describes how a new national curriculum 'should embody rigour and high standards and outline a core of knowledge in traditional subject's disciplines' (DfE, 2010: 42) and encourage students to think critically and be active thinkers. Despite being widely practiced in classrooms for over two decades, it is still often hard to define, as recognised by (Spronken-Smith *et al.*, 2008: 72) and Deignan (2009) who suggest that EBL is actually practiced more in classrooms than we believe, but is not always classified as EBL.

The department for education (DfE) defines enquiry as a method of learning which 'encourages questioning, investigation and critical thinking – key skills in terms of intellectual development and the acquisition of workplace skills' (Ofsted, 2011: 8). Although this states what enquiry involves it fails to specifically define the term. Roberts a key advocate for EBL defines the process as 'an approach to learning that accepts that knowledge has been constructed and prioritises the need for students to make sense of things for themselves' (Roberts 2010: 7). With reference to geography, she explains it should be seen as an 'active process through which learners construct knowledge about the world' (Roberts 2003: 6). These definitions recognise the

importance of building on prior knowledge and encouraging students to think autonomously and critically to formulate valid conclusions.

2.2 Learning through Enquiry

Roberts claims that there are four essential aspects to learning through enquiry. These being:

> 'It is question driven and encourages a questioning attitude towards knowledge, students study geographical data and sources of information as evidence, students make sense of information for themselves in order to develop understanding, students reflect on their learning'. Roberts (2003: 51).

This is represented in the following diagram:

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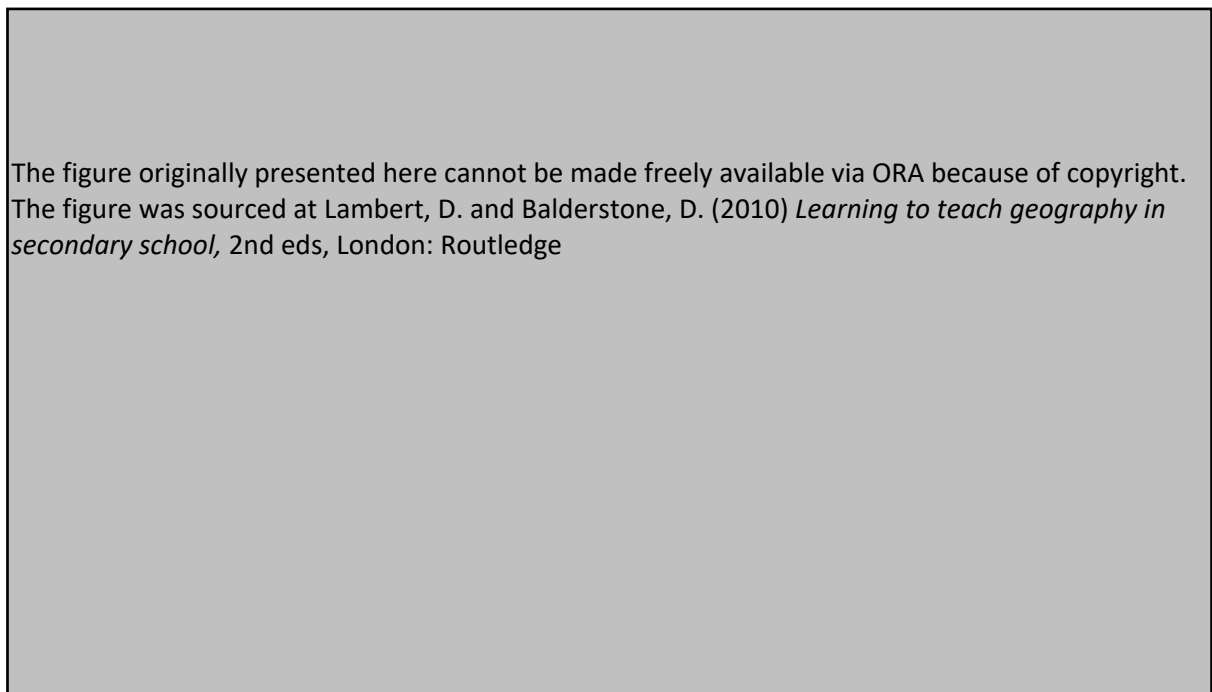
Figure 1

Roberts (2003) claims a need to know basis must be created where students think autonomously about the questions presented. This can be achieved by encouraging

students to create hypotheses and ask questions relating to what information they require to answer them. This aspect of the enquiry process compliments group work and collaborative learning. According to Barnes and Scoffham, 'working together is a vital part of sustainable thinking and learning, and of creativity too' (Barnes and Scoffham, 2017: 187). This aspect requires students to challenge their findings and consider if their conclusions are valid and if they can improve the entire enquiry process. Lambert and Balderstone propose it is important to see 'relationships between different bits of information, to make connections and relate it to what we already know' (Lambert and Balderstone, 2010: 198).

Naish *et al*. (2002: 64) identify the value of viewing students as active participants 'in a sequence of meaningful learning through enquiry'. These attributes are also recognised by Roberts (2003) who notes the advantages of prompting students by questioning and encouraging them to ask questions for themselves. However, Kissock & Iyortsuun (1982) ascertain that the questions asked of students need to be carefully considered if questioning is going to be effective. If conducted appropriately 'effective questioning has greater potential than any other teaching method for stimulating student thinking…' Kissock & Iyortsuun (1982: 9).

2.3 Historical Development of EBL

The development of enquiry has been attributed to Piaget's (1972) and Vygotsky's (1978) work on the constructive theory of learning. Constructivism is a theory of learning which views knowledge not as a product but as a process. It is the idea that knowledge cannot be simply given to another mind through repetition and that knowledge must be constructed. Constructivism involves learning through actively doing, and making sense of things for ourselves.

Dewey (1933) wrote widely on the links between thinking, reflection and experience and promoted 'learning by doing', what we now recognise as active learning, and an essential aspect of enquiry learning. He argued that students do not learn from repetition, rather real world tasks, which involve creativity and collaboration. This view is also shared by Piaget (1972) who claimed that knowledge is not passively assimilated; rather it is comprised dynamically through active learning. Piaget's theory is stage dependent where learners progress though four stages of development and grasp new concepts depending on their maturity. These stages are sensorimotor (birth to twenty-four months), preoperational (two to seven years), concrete operational (seven to twelve years) and formal operational (adolescence through adulthood). Whilst Vygosky (1978) agreed that knowledge is acquired through active learning he did not agree with Piaget's stages of development and believed that it is possible to separate learning from its social context. Despite these differences of opinion both did agree that if learners cannot understand new information then existing schemes of assimilating information to learners must be changed. This is known as accommodation.

Vygosky (1978) as quoted (Cakir, 2008: 196) viewed language in learning as 'central to the development of thought' and a psychological tool which can be used to initiate higher order thinking. As cited in Brader-Araje and Jones (2002: 4), Vygosky believed that 'speech served not only as a way for children to communicate about their actions, but also served to direct active learning'. Vygosky also proposed the idea of zones of proximal development. This theory has now become known as scaffolding. EBL uses both scaffolded learning theory, and a constructivist approach to learning. Scaffolded learning theory involves teachers modelling how to solve a problem and then stepping back offering support when needed, whilst a constructivist approach encourages students to be actively involved in the process of knowledge and construction. In

support, Roberts (2003) identifies EBL follows a constructivist approach. Influenced by Vygotsky's work, Bruner (1990) recognised the important role, which the teacher, language and instruction play in learning. He claimed that students learn through active use of dialogue with teachers and peers, and should actively reflect on their learning. Based on these ideas, Bruner went on to initiate curriculum change. These are the foundations of EBL in the modern classroom.

2.4 Advantages of EBL

Deignan conducted research in West Yorkshire to determine how advantageous EBL can be. The study showed that 'enquiry based learning can be better than traditional methods, which are often inappropriate' Deignan (2009: 18). Deignan claims traditional didactic teaching methods are too dependent on the teacher and are inappropriate for modern students learning needs. He identified that when taught by traditional methods students feel that they struggle to concentrate for long periods of time due to the lesson being too teacher led. Deignan also claims that EBL helps the lesson feel more structured and encourages students to feel more motivated and willing to achieve the lessons objective. Therefore, enquiry can stimulate student interest in a subject. Deignan's research suggests that EBL encourages 'less academically able students to perform better than they would otherwise do'. (Deignan, 2009: 28). However, Deignan fails to identify specifically why this is.

Green and Murris (2014: 2) recognise that EBL encourages students to think autonomously and 'generate and explore their own question'. They further identify that 'students are more motivated to engage with tasks because they are based on questions that they 'own' and find interesting'. Thereby identifying a link between autonomy and motivation. Deignan supports this view, claiming EBL helps students to develop their

independence skills and teaches them 'how to learn'. Deignan further states that EBL compliments collaborative learning as well as autonomous work. His study shows that enquiry learning develops 'team-working and problem-solving skills' (Deignan, 2009: 19). Green and Murris state that through enquiry 'students learn to dialogue with others in a way that makes it possible for new understandings to emerge' (Green and Murris, 2014: 2). Thereby, recognising the potential enquiry has to compliment group work.

Deignan's study concedes 'the process of discovering information as being at least as important as the "product" of having the information' (Deignan, 2009: 19), which is a strong case for EBL. Deignan identifies that EBL produces independent learners with other transferable skills. This has also been acknowledged, by Ciardiello (2003) and Green and Murris (2014). Green and Murris claim 'students gain dispositions, attitudes and skills that are essential for citizens' (Green and Murris 2014: 2). Roberts (2013) observes that enquiry is useful in developing twenty first century skills and that it enables students to learn more than just content. The challenges presented to students through the enquiry process, help to develop literacy, numeracy, ICT, citizenships and work skills such as self-reliance, independence and flexibility. Green and Murris observe that EBL can enable students to become 'better able to engage with, and make judgements about, new information, which means that their learning is more successful and they are better prepared for an unpredictable future' (Green and Murris 2014: 2). This implies that EBL helps students to become critical thinkers, something that has also been recognised by Roberts (2003). The skills that are developed through EBL are vital to a modern work environment, which is, arguably why employers sometimes favour those who have studied geography.

2.5 Disadvantages of EBL

EBL has its limitations, as identified by Roberts (2013) who claims 'enquiry based learning makes demands on teachers "geographical and pedagogical knowledge"'. Deignan also recognises that EBL places more demands on teachers 'than delivering a prepared lecture' (Deignan 2009: 19). In addition, Ratvich *et al.* identified that teachers are often ill-equipped to teach EAL students, with the need to shift away from education perspectives 'which are based on Eurocentric and monocultural views of society, culture, schooling, and learning is necessary' (Ratvich *et al.* 2016: 124). They recommend that teachers need to become multi-culturally competent to teach. This lack of preparation to teach other cultures is also acknowledged by Gopal (2011) who claims that teachers are given basic training on different learning styles but are not given training on how to negotiate other cultures. This can result in students being taught ineffectively.

Deignan states that EBL is 'highly adaptable, but assessment can be problematic' Deignan identifies that 'the assessment of student learning in EBL is more problematic than with traditional methods of coursework assessment' (Deignan, 2009: 18). However, Deignan fails to specify why this is. It could be because EBL encourages open-ended questioning. Naish *et al*. (2002), also submit that EBL assessments are more challenging to mark and level. This has become even more challenging with the introduction of the new rigid level system implemented in schools across England in 2016. Deignan claims that EBL promotes 'a "do-it-yourself" education that requires students to teach themselves' (Deignan, 2009: 18). This method of teaching develops important autonomous skills but my teaching practice has demonstrated to me to that lower ability students cannot cope with 'teaching themselves'. This is why it is

important for teachers to act as facilitators and offer students support throughout the entire enquiry process, as recognised by Kahn and O'Rourke (2005).

Roberts (2003) recognises that geography like the sciences, is an investigative subject which compliments the use of questioning but not all subjects lend themselves to questioning, making EBL difficult to implement. Birnie (1999) recognises that in the UK, some syllabuses promote enquiry learning more than others. Whilst in the 21st Century, EBL has been more widely implemented across syllabuses, there are still discrepancies with some syllabuses placing more of an emphasis on EBL, than others. Roberts (2013) recognises that enquiry-based examination questions are not widely used in all examination specifications. Specifically, that there is no enquiry based questions on the AQA GCSE Geography, examination board specification A. Even though a new specification was implemented from 2014 onwards, there are still no enquiry questions present. However, the WJEC GCSE Geography A, examination board specification does include enquiry questions, such as 'How are European city centres changing?' The variation in the level of enquiry questions, makes it questionable whether EBL has been widely adopted in Britain. If EBL is not widely adopted across all specifications, it will not be practiced effectively. Perhaps this is why there is so much disparity as to what EBL involves.

Roberts (2013) has identified four pedagogical challenges of EBL. She claims that in order to conduct an effective enquiry, students need to be asked open questions. Teachers are required to plan activities that allow students to think critically about the data, which they are presented and make reasoned arguments. Teachers need to make effective use of dialogic teaching encouraging class discussions where students can challenge ideas. Finally, teachers need to make effective use of scaffolding, whether this

are differentiated worksheets or prompting questions. At times these challenges can be hard to overcome, particularly if students are disengaged with school or a subject like geography. When Chinese students arrive at secondary school in the UK, many of them have little knowledge or experience of formal geography lessons. This presents teachers with the difficult task of motivating them and unless students can be engaged in these initial stages, the whole enquiry process will fail. Roberts identifies that teachers 'need to plan activities that help address the key enquiry questions, that are likely to provoke genuine questions that enable students to study evidence critically and develop reasoned arguments' (Roberts, 2013: 51). The teacher needs to be experienced and understand the needs of all students if these activities are going to be effective.

Roberts determines that geographical enquiry requires more classroom time. She claims 'in enquiry based geography there needs to be time for students to make sure for themselves through studying data, through discussion, writing and representing their ideas graphically' (Roberts 2013: 15). Roberts further suggests:

> 'If an enquiry approach is to be adopted, syllabuses should have fewer topics so that there is time in the classroom for students both to develop geographical knowledge and understanding and also to develop the wide range of skills needed for enquiry and relevant to life in the 21st Century' (Roberts, 2013: 15).

Many syllabuses in England include so many topics there is little time to go into depth and truly develop geographical knowledge and understanding. This has become increasing difficult with the implementation of the new national curriculum in geography.

Roberts (2013) has identified that there are restrictions within schools, which limit the effective practice of EBL. Schools have become increasingly dogmatic about classroom practices such as:

> 'Presenting objectives rather than questions at the start of lessons, having discrete, short 'starter' activities regardless of whether they provoke curiosity in what is being studied, plenary activities that do not necessarily allow time for worthwhile reflection, emphasing teachers questions rather than dialogic talk, and pace rather than thoughtful deliberation' (Roberts 2013: 52).

Roberts further recognises, 'the value of all these practices is open to debate and each of them can work against the more, open, investigative approach of enquiry based learning' (Roberts 2013: 52). My teaching practice supports this claim.

2.6 Does EBL Lend Itself to Geography?

In her 2003, publication 'Learning Through Enquiry', Roberts focuses predominately on KS3 and explores ways in which geography can be taught through enquiry. Roberts (2013) publication 'Geography Through Enquiry' looks at KS3 to KS5 and was written as a result of her work in Singapore and as a PGCE tutor at the University of Sheffield. Although this publication has an international outlook and does recognise that the modern classroom is diverse, it fails to acknowledge that students from different cultural backgrounds may struggle to access EBL in a mainstream classroom. Geography is considered a social science because both aspects of the subject, physical and human geography lend themselves to a methodological approach. This approach involves using a series of techniques both qualitative and quantitative to answer a question clearly explaining a sequence of methods and giving justification for each.

Roberts claims that it is 'the context in which it is applied that makes it geographical'. (Roberts, 2003: 6). She recognises that initially enquiry was associated with geographical fieldwork but is now regarded as an effective and inspirational method of learning in the classroom. Roberts as one of the main advocates for an enquiry based geography curriculum claims 'I think of enquiry, not simply as a set of skills but as an approach to teaching and learning geography'. (Roberts, 2013: 8). She further claims that there is a lot more to enquiry, such as the development of critical thinking and key skills Roberts explains 'geographical knowledge is a construction rather than something "out there" to be found… It is formed by questions and imagination that geographers bring to the task.' (Roberts, 2013: 17-18). Here, Roberts suggests that enquiry is key to geographical learning.

Roberts (2010) also claims:

> 'another reason why I think geographical enquiry is important is related to motivation. It seems important that the questioning attitude that young children have about the world is fostered throughout the years of schooling. I believe that students will learn more if they have been made curious about what they are about to learn and are encouraged to continue asking questions' (Roberts, 2010: 7)

Roberts recognises the importance of students questioning, and the positive influence this has on their motivation. Leat (2016) claims 'Geography students need to know environmental systems, processes and patterns evident at a variety of scales. They also need map skills, graphical skills and data interpretation skills' (Leat, 2016: 137). EBL compliments all of these skills but modern geography students need to know a lot more than environmental systems. Further, geography is a subject, which students are naturally inquisitive about, regularly asking questions such as 'what is the largest

continent' or 'how many countries are there in Europe?' This suggests that geography

does present teachers with the opportunity to incorporate EBL into their lessons.

2.7 The History of the Chinese Education System

It is important to understand the history of the Chinese education system, as it has a

major impact on Chinese students' ability to access EBL when they arrive in England.

Traditional Chinese society followed a Confucian method of learning, based on social

and ethical philosophy. In Confucius' pedagogy:

> 'the student initiates inquiry, the teacher detects the student's 'horizon of
> readiness' and engages him or her in "heart-to-heart" dialogue with the help of a
> classic text. Knowledge is treated as "intuitive insight" and language is kept to a
> minimum (Deng, 2011: 564)'.

From 1966-1977, education followed a soviet model and wiped out Western and

Confucian education. In 2001, the Chinese Ministry of Education issued the policy

document 'Guidelines for Basic Education Curriculum Reform' (Trial) which called for

a curriculum reform, which followed a more western approach. The policy states that

learning should be more active with 'a change in mode of learning from passive

knowledge absorption to active learning and knowledge construction' and 'a change in

pedagogy from lecturing/recitation/rote learning to inquiry and problem based learning'

(Dai *et al*. 2011: 140). According to Huang 'Chinese students prefer passive teaching

methods such as lectures and demonstrations' (Huang, 2005: 37). This is worthy of

consideration but it should be noted, it is not necessarily valid for all students. There are

concerns about the open-ended nature of EBL and that 'students' lack of knowledge and

ability to handle the learning tasks without explicit teaching' (Dai *et al*. 2011: 154). Dai

et al.'s (2011) research found that teachers do support the practice of EBL in Chinese

schools but have concerns over how effective it can be in practice. Overall, it was recognised that EBL 'is theoretically sound but practically difficult to implement in current educational and social contexts in China' (Dai *et al*. 2011: 153). This may have restricted EBL from being practiced effectively in China.

2.8 Beyond Gaokao

Since 1952 Chinese students have worked towards sitting the National Higher Education Entrance Examination, also known as gaokao. This annual examination is sat in the last year of senior high school and is a prerequisite into almost all higher education institutions. Kirkpatrick and Zang recognise the significance of this examination and claim

> 'All Chinese high school students have the same objective, *gaokao*. Doing well in tests curries favour in the *gaokao*, which demands memorizing significant volumes of information for the purpose of passing tests' (Kirkpatrick and Zang, 2011: 39).

Schmitz (2011) claims that it is the focus on examinations that causes students to lose their creativity and hence struggle with the enquiry process.

Dahlin and & Watkins (2000) recognise that in China creativity is seen as slow process involving much effort, repetition and a strong knowledge base. This view is supported by Cheng who claims the Chinese consider 'knowledge and skill learning as preceding creativity development' (Cheng, 2004: 142). My teaching practice has taught me that Chinese students do find enquiry learning challenging, as they do not have the necessary skills to conduct the enquiry, not due to a lack of creativity. Students regularly demonstrate a creative flare in art. Tan (1999) and Cheng (2004) advocate that it is the teacher's job to facilitate creativity. Not all Chinese students have these skills when they

arrive in England, but as Helms (2015) states they should be able to learn these skills in time.

Recently the National Long-Term Education Reform and Development Plan (2010-2020) highlighted how the Chinese education system is attempting to follow a more international approach. Gordon and Liu (2014) identify that to promote this plan there is a new form of school in China aimed at wealthy families, which does not requires its students to sit gaokao. Instead students follow a more western method of teaching and learning which prepares them for studying overseas in western universities.

2.9 Current Research in Chinese Education

Xin and Lin (2000) conducted a study of three hundred and forty-seven teachers in China. The majority of the teachers were categorised as dominant, acting as facilitators of information. This contradicts the enquiry process, making it challenging to conduct. Jin and Cortazzi (2006) recognise that students being facilitated information by a teacher is a common perception of the Chinese education system. This is based on the belief that in China knowledge is static, as identified by Kennedy (2002). However, Jin and Cortazzi (2006) claim that traditional efforts of students in China are often overlooked. They explain that even if a teacher acts as a facilitator, students are required to practice reflective thinking, information independent interpretation and put what they have learnt into practice. This implies that students might not be aware of it, but are learning through enquiry to some extent.

Chan (1999) identifies that students in China have been taught to have a great respect for their teachers. This is a positive trait but can act as a barrier when teaching EBL. Huang claims 'Due to high power distance, the teacher is held in great respect; students

would regard it as disrespectful to ask questions or debate with teachers in class' (Huang, 2005: 37). Bond (1991) further explains that Chinese people may struggle in situations where there are no prescribed answers. These cultural barriers are a challenge for EBL.

Zhang *et al.* (2005) conducted research in Chinese schools over a two-week period, focusing on how students learn through EBL. The study focused on science and found that large class sizes (49±6) acted as a barrier to creativity and restricted the enquiry process. In addition, the classroom was laid out in a formal style with desks facing the front, which did not enable students to move around the classroom freely or communicate in small discussion groups. The smaller class sizes in this investigation lent themselves to effective EBL. The study further found that teachers faced 'significant challenges such as the pressure of national college entrance exams, transforming traditional curriculum, and equitable distribution of inquiry resources across urban and rural schools' (Jin *et al*. 2016: 340). It recognised that to support teachers effectively 'it is important that policy-makers and teacher educators consider teachers' concerns and provide necessary supports and resources' (Jin *et al*. 2016: 340). The study found that there is an enthusiasm for EBL in Chinese schools and teachers are willing to teach it.

A limitation of Zhang *et al.'s* (2005) study is that it was conducted in large cities where participants came from fairly wealthy backgrounds and not where the majority of the population is based. A further limitation is that no data was collected from students and the study focused on the teacher's willingness and ability to teach through EBL. Anecdotal accounts of participants suggest that students who had not liked chemistry were more engaged, however high attaining students, were sceptical claiming that they

would lose the advantages of instruction if the lesson was too enquiry based. The motivation for these students came from hard work to attain good results and to go on to further education. A common theme limiting the success of EBL was the influence of college entrance examinations on teaching practices. The Chinese college entrance exams still favour traditional methods of teaching which act as a barrier to EBL. This is now changing to include more test items, which could reflect the results of EBL. Currently the resources, which help teachers educate or practice EBL, are limited, thereby restricting the practice of EBL.

Recently, Zheng (2017) conducted a study into Chinese students learning attitude towards science in relation to collaborative EBL. After three months of study it was proven that collaborative learning had improved learning attitudes. However, although learning attitudes were improved, there was limited evidence that it had advanced levels of knowledge.

2.10 The Challenges of EBL for EAL Students

The modern English classroom is culturally diverse, with an increasing number of students having experience of different countries education systems before arriving in England. The DfE claim that:

> 'In secondary schools, 15.7% of pupils are exposed to a non-English language in their home. This rate has also steadily increased over the last ten years and by 0.7 percentage points since January 2015' (DfE, 2016: 10).

Current research generalises the challenges which EAL students face and does not focus on specific cultural differences. Vita recognises that learning styles used in the modern English classroom may present challenges to EAL students. Vita claims 'many teachers and management educators find that even well-prepared lectures or workshops often fail

to engage all students when the composition of the cohort is multicultural' (Vita, 2001: 165). Vita suggests one of the reasons for this 'lies in the mismatch between the instructor's teaching style and the students' learning styles' (Vita, 2001: 165) and that EAL students may be 'culturally predisposed to learn in ways that may not (always) be compatible with the "local" and "common" methods of instruction, the latter being themselves subject to cultural conditioning'. (Vita, 2001: 165) This raises the question whether EBL is effective for EAL students, and whether it needs to be adapted if it is to be effective.

Crose (2011) conducted research in schools in the US and also identifies different learning styles as a challenge for international students. Crose recognises that language barriers and the preconceived cultural traits can be challenging for international students. Theodoridis (2015) recognises that cultural differences might restrict international students from participating in lessons and claims that they might not be able to cope with an open classroom environment. This can create perceptions that EAL students are not intelligent which can create barriers between them and the rest of the class. Theodoridis claims another reason for limited participation 'could be a limited command of language which may discourage students from expressing themselves publicly' Theodoridis (2015: 4). This is something I have observed in my teaching practice, particularly when students have just arrived from another country. Montgomery (2010) claims that native students avoid interacting with EAL students because of the concern that their comments may come across as ethnically insensitive. Whilst Jones (2010) proposes that native students are unwilling to take the additional time to explain unfamiliar terminology. This lack of interaction between native and EAL students can undermine the enquiry process.

2.11 Supporting EAL Students in Accessing EBL

There are still inconsistencies in how best to support EAL students and little advice is available on how to support Chinese students. Costley identifies that 'English as an additional language is not a tangible or recognised curriculum entity in England, even though for many teacher's multilingual classrooms are an everyday reality' and further highlights that 'although the number of EAL learners is increasing, funds and resources previously ring-fenced for EAL are decreasing' (Costley, 2014: 288). Although the DfE (2013) does recognise that the new standards, require teachers to have a good understanding of EAL students, there is little guidance on how to support these students, especially where EBL is concerned.

Creese (2010) found that one of the biggest challenges EAL students face is that there is no content curriculum for EAL students. This being an 'officially endorsed body of classroom materials, resources, and pedagogies for the teaching of the curriculum at different stages of English language development' (Creese, 2010: 99). Arguably without this in place EAL students will struggle to access the curriculum let alone an enquiry based curriculum. Creese further recognises 'English schools are an essentially sink-or-swim environment where language acquisition is meant to happen through inclusion into the unproblematic mainstream classroom' (Creese, 2010: 99). Creese conducted research into how geography is taught to a year ten class with a few EAL students present. The geography teacher taught a series of lessons with an EAL specialist. Creese states that if EAL students are to access a curriculum and truly understand it, then the EAL specialist needs to have 'the same skills as subject teachers in terms of both the what and the how of the curriculum' (Creese, 2010: 105).

Although Creese's research does not focus on EBL, it does highlight how EAL students are marginalized in the geography classroom and brings to light a few potentially useful differentiation strategies. For example, definition cards explaining the meaning of the key terms, with only essential words being used. Creese (2010) further describes the importance of adapting the curriculum for the EAL students through simplification and effective collaboration between the geography teacher and the EAL specialist, producing suitably differentiated pre-prepared resources. Lemke (2002) critiques these differentiation methods along with the current curriculum as a whole, claiming that it focuses on teaching students the curriculum rather than making sense of the meaning of the concepts.

Research by Cajkler and Hall suggest that 'on entry to the profession, the vast majority of primary NQT's have had some preparation for the task of teaching EAL, but there [is] significant variability in the amount and effectiveness of this preparation'. (Cajkler and Hall 2009: 166) Teachers may have an understanding of EAL students' needs, but there are inconsistencies in how to support these students. Costley (2014) recognises that many teacher now choose to qualify through School-Centred Initial Teacher Training (SCITT), which means that some schools offer excellent training and EAL provision whilst others may be lacking. Costley also recognises that this might result in regional variation of understanding and quality in EAL provision. Costley states 'local priorities, funding, facilities, resources, and attitudes are some of the things that have shaped and determined the classroom and learning experiences of EAL learners' (Costley, 2014: 289) and that these have been inconsistent. Edelson (1999) acknowledges that it is the teacher's responsibility to address the students' motivation and manage the enquiry process effectively with suitable resources. Arguably, effective motivation of students will lead to participation in the enquiry process with a greater confidence.

Naish *et al*. (2002) understands that in open-ended enquiries students 'require encouragement and support from the teacher to identify the full range of possibilities, to clarify their own position and decide on appropriate action' (Naish *et al*. 2002: 68). Naish *et al*. comprehends that students can be supported at times by using a closed enquiry process, where there 'is one technically correct answer, obtainable through a clearly defined series of steps' Naish *et al*. (2002: 68). For example, 'How many housing units might be built here?' (Naish *et al*. 2002: 68). However, these ideas fail to acknowledge how EAL students may specifically be supported. Hmelo-Silver *et al*. claim that when referring to EBL 'an assumption that leads to the minimally guided discovery approach is that the learners need to explore phenomena and/or problems without any guidance' (Hmelo-Silver *et al*., 2006: 100). They claim that students who learn through this method require support through methods like scaffolding. Hmelo-Silver *et al*. (2006) claim that scaffolding can occur in different forms, whether this is structuring complex tasks to keep track of facts or offering expert information and guidance in the form of lectures.

Theodoridis (2015) suggests that to support EAL students, teachers should take the time to get to know them. This should help them to become active learners, which will help them to access EBL. This is supported by Vita (2000), who recognises that if teachers take the time to get to know EAL students, and form positive relationships with them, it should help the students' confidence. Theodoridis (2015) claims that it is important to offer EAL students detailed feedback in written form, which will assist them with their motivation and encourage them to reflect on and improve their work. However, this will not make accessing EBL easier because it does not address the learning barriers which they may face. In support of Creese (2010), Theodoridis (2015) acknowledges the importance of offering students support facilities like key words on sheets or writing

frames, which can help students to access tasks. This should be viewed as differentiation strategies. Crose claims the 'classroom needs to be perceived as inviting and conducive to learning from the first time the student enters the classroom' Crose (2011: 389). Crose believes that EAL students must feel confident in their surroundings if they are to access learning effectively. My teaching practice has confirmed this theory. Crose identifies that teachers should adapt their lessons to suit the needs of all their students. However, as Vita (2000) identifies, teachers are often not equipped with the skills to do this. Perhaps, schools should run Inset programmes, which equip teachers with these skills.

Vita (2000) claims that it is important for teachers to limit their speaking and offer students more activities. She further claims EAL students benefit from active learning tasks. These tasks reduce the reliance on understanding spoken word, which EAL students often find challenging. In contrast, Mercer (2000) identified characteristics, which teachers can use to talk effectively in the classroom. They claim teachers should encourage students to solve problems and make sense of experience, by the use of questions and answers thereby developing the level of understanding. Teachers should treat learning as a social communicative process where students are encouraged to take more of an active, vocal role in the classroom.

Barnes and Scoffham (2017) claim that collaborative learning is a key part of the enquiry process. Vita (2000) proposes that collaborative learning can be encouraged by allowing students time in lesson for informal discussion. Vita (2000) promotes actions such as putting students into small groups, providing students with discussion topics and pairing them up with other EAL students, who speak the same language to practice their responses to discussions topics. Vita (2000) recognises that it is important for teachers

to offer students support throughout this process and where possible try and draw them into classroom discussions. However, if informal discussion is introduced in some classes, students will neglect the opportunity to participate in the enquiry process by talking in their friendship groups about irrelevant topics. A view supported by Theodoridis (2015) who recognised that the formation of intercultural groups within classrooms could be an issue. However, if managed effectively, inclusive classroom discussions could encourage EAL students to participate. Crose (2011) supports this view and recognises that group work can be effective in encouraging EAL students to work collaboratively with other students, helping them to access EBL. For this approach to be effective Crose proposed teachers need to design tasks suited to a collaborative approach and select and manage groups effectively.

Edmundson (2007) recognises that unfamiliar assessment techniques may cause EAL students stress. Crose (2011) suggests a solution could be to present students with a level system with descriptions so that they understand what is required of them. Students could also be presented with model answers. Finally, Roberts (2003) advocates that reflecting upon learning is a key aspect of the enquiry process.

2.12 Summary of Literature

The Chinese education system is exam orientated and led by dominant teachers who facilitate information to students. This has left minimal opportunities for teaching and learning through creative methods like EBL. When Chinese students arrive in England, they are unfamiliar with geography's EBL style, which has resulted in them encountering barriers to learning. The investigations first aim was '*to identify any barriers which students from Mainland China face when accessing EBL in geography*'.

There are currently limited strategies specifically available for Chinese students, which help to reduce these learning barriers. Current strategies focus on EAL students in general and do not take into consideration additional cultural factors. Strategies range from the use of key word sheets and writing frames, to effective collaborative learning. The investigations second aim attempts *'to develop differentiation strategies which assist students from Mainland China in overcoming these barriers to learning'*. The success of these new strategies must be assessed, and so the investigations third aim endeavors *'to assess the effectiveness of these differentiation strategies'*.

3.0 METHODOLOGY

Three methods were used to collect primary data.

1. Teacher led student interviews

2. Action Research Cycles: Development, Implementation and Evaluation of the intervention of differentiation strategies

3. Classroom observations of my teaching practice by the EAL specialist

The samples for this study were three KS3 mixed ability classes consisting of both male and female students. Within these classes there were six Chinese students in 7D1, five in 8A1 and five in 9C1, a total of sixteen students. KS3 was chosen as all students are required to study geography at this level and ensured that I had a large enough sample to draw valid conclusions. The uptake of geography at KS4 and KS5 by Chinese students is low. Currently in year eleven, only four out of thirty-eight students chose geography, which made it difficult to conduct an in-depth study at this level.

3.1 Teacher Led Student Research Interviews

3.1.1　Reasoning

Interviews were conducted in recognition of Kvale's claim that we should not view human subjects as external from data, we should consider knowledge 'as generated between humans, often through conversations' (Kvale, 1996: 11). An advantage of interviews is that they are 'a flexible tool for data collection, enabling multi-sensory

channels to be used: verbal, non-verbal, spoken and heard' Cohen *et al*. (2011: 409). For research interviews to provide reliable non-biased information they must be conducted effectively. Cicourel (1964) has listed five limitations of an interview situation, which although somewhat outdated, are still valid today. These are that mutual trust between the interviewer and respondent may influence results. The respondent may feel uneasy and be unwilling to offer reliable answers. The interviewer might withhold information and the meanings of phrases may not be clear to others. Finally, it is not possible to bring all aspects of the encounter within rational control.

The interviews took a standardised open-ended approach. Patton proposed that this means 'the exact wording and sequence of questions are determined in advance. All interviewees are asked the same basic questions in the same order' (Patton 1980: 206). The advantages of this approach are that the responses are easily comparable, a complete set of data is acquired for all students and the data can easily be analysed. Students also had the opportunity to elaborate on their answers, therefore providing detailed answers. The limitations are that there is little flexibility in the interview and the standardised wording of the questions may limit the naturalness of the responses.

Open questioning was used during interviews in support of Wright and Powell who claim that they help avoid a single answer type response and 'are usually more accurate than answers to closed questions' (Wright and Powell, 2006: 317). Closed questions can lead to the respondent not thinking and offering biased answers. Particularly with Chinese students, open questions can take into account the limited linguistic and cognitive abilities. The interviews took a structured approach where preplanned open questions were asked. This could be 'administrated relatively easy and quickly' (Thomas, 2017: 204) and where necessary students were encouraged to elaborate on

their answers, ensuring that the interview process would not be too daunting and would keep students engaged. It also suited the age range of the respondents and kept the interview focused on answering the investigations aims. Due to the language barrier, it was appropriate to use terminology, which the students could access, for example "hard" instead of "difficult". A sample of the interview questions asked and justifications for each question can be found in appendix 1. Thomas (2017) identifies limitations to structured questioning claiming that whilst you can note the respondent's general demeanor in response to your questions, you don't have an opportunity to follow up these signals with further questions if you limit yourself to the format of a structured interview. This is a valid point, but as language is currently a barrier for the respondents, it is important that I pre-consider and ask questions, which they are able to understand and offer reliable results and comparisons.

Group interviews were conducted in support of Cohen *et al.* who claims that group interviews should be conducted 'as it can encourage interaction between the group rather than simply a response to an adult's questions' (Cohen *et al*. 2011: 433). Greig and Taylor claim that where children are concerned, group interviews might offer more reliable answers because they 'might be less intimidating for them than individual interviews' Greig and Taylor (1999: 132). As recognised in studies by Lewis (1992) group interviews enable students to challenge each other and present new ideas, which one-on-one interviews would not produce. To investigate Lewis's (1992) research claim that a group of six to seven is the best size, I tried to keep as close to this as possible. All interviews were kept to less than fifteen minutes to ensure that students remained focused and basic language was used to suit the respondents' age. To recognise Cohen *et al.'s* (2011) and Greig and Taylor's (1999) claims, the interview room was laid out in a transparent fashion, so that everyone could see everyone. My initial intention was to

conduct the interview during class time, however after further consideration, I realised that due to distractions from other students, the respondents may not offer the most reliable results. All interviews were therefore undertaken during lunch times.

3.1.2   Conducting the Research

The intention was to conduct a group interview with all Chinese students. However, only four students were available to participate in the interviews. Students were initially interviewed to determine how they felt they currently coped when accessing EBL and to establish if they could recognise and identify any learning barriers. They were asked if they felt that EBL was useful in developing their general and specifically geographical skills. To maintain consistency and keep their minds focused on the barriers of EBL, students were asked the same questions at both the first and second group interviews. All interviews were digitally recorded and backed up by a written transcript (appendix 2). The data was analysed qualitatively.

3.2 Action Research Cycles

Action Research Cycles were used to identify any learning barriers, which the Chinese students might have which restricted them from accessing EBL. They followed a participatory practitioner action research method, where I collaborated with staff and students to improve and develop new differentiation methods. Practitioner research refers to 'any piece of research carried out by a practitioner which has, as its focus, the concerns of that practitioner's profession, can be defined as practitioner research' (Edwards & Talbort, 1997: 61). Action research originates from Lewis's (1992) work on social disadvantages and is now an accepted educational research method. Hopkins defines action research as 'the combination of action and research renders that action a

form of disciplined, rigorous enquiry, in which a personal attempt is made to understand, improve and reform practice' (Hopkins 1985: 32).

Action research cycles were used to collect the data based on Tripp's (1995) full action research circle (figure 2).
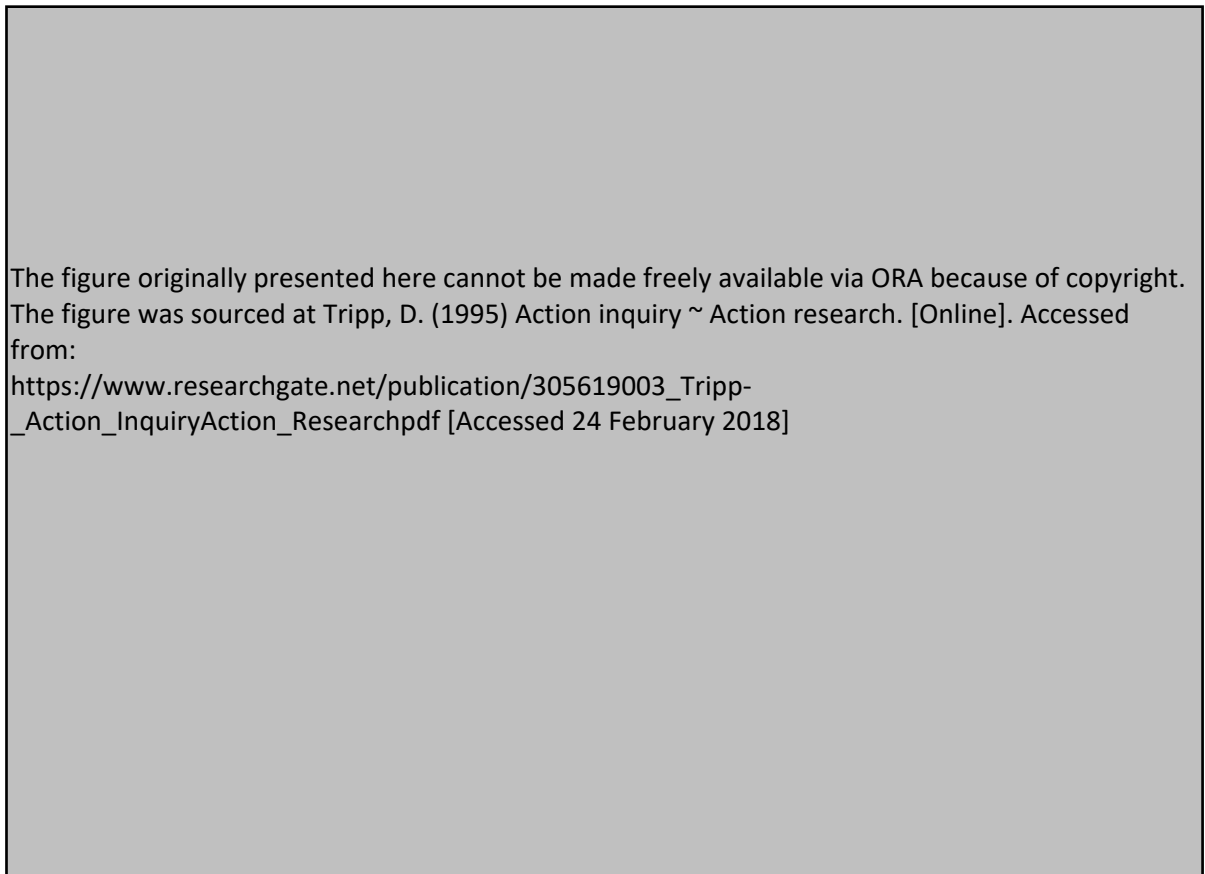
Figure 2

The cycles consist of plan action, acting thoughtfully, research action and evaluating action. The advantages of participatory action research are that it is flexible, collaborative, encourages reflection and critique of current practice and helps to develop and improve new strategies. It is also empowering for the all participants who feel that they are responsible for positive change. Cohen *et al.* recognises that it 'offers rigour, authenticity and voice' (Cohen *et al.* 2011: 361).

3.2.1. Development, Implementation and Evaluation

The research cycles took place over a twelve-week period. In week one of the research cycle each of the three classes were taught an initial double lesson. The lessons were based around an enquiry-based question and required students to complete a series of tasks, individually and collaboratively to solve the learning objective. The Chinese students work was collected and analysed by the EAL specialist and myself during weeks two and three. From these initial observations, differentiation strategies were developed which aimed to reduce the identified learning barriers and make the lessons more accessible for the Chinese students. My current attempts to provide for the Chinese students needs had been ineffective. It had consisted of generalised differentiation techniques such as writing frames, which were used for low ability students.

In week four of the study, further double enquiry based lessons were taught to the same three classes, with the differentiation strategies applied. The sample students' work was collected for analysis and conclusions were drawn by the EAL specialist and myself over the effectiveness of the differentiation strategies. The differentiation strategies were then further refined over weeks five and six and new strategies developed. This process was repeated in week's seven to twelve. Conclusions were then drawn on how effective the differentiation strategies had been in reducing learning barriers and making EBL more accessible to students. To support Edmundson's (2007) proposal that unfamiliar assessment techniques may cause students stress, which will hinder the reduction of learning barriers, at each stage of the research cycle, students were given similar tasks. An outline of the taught lessons can be found in appendix 3, whilst the research cycles are explained diagrammatically in figure 3.

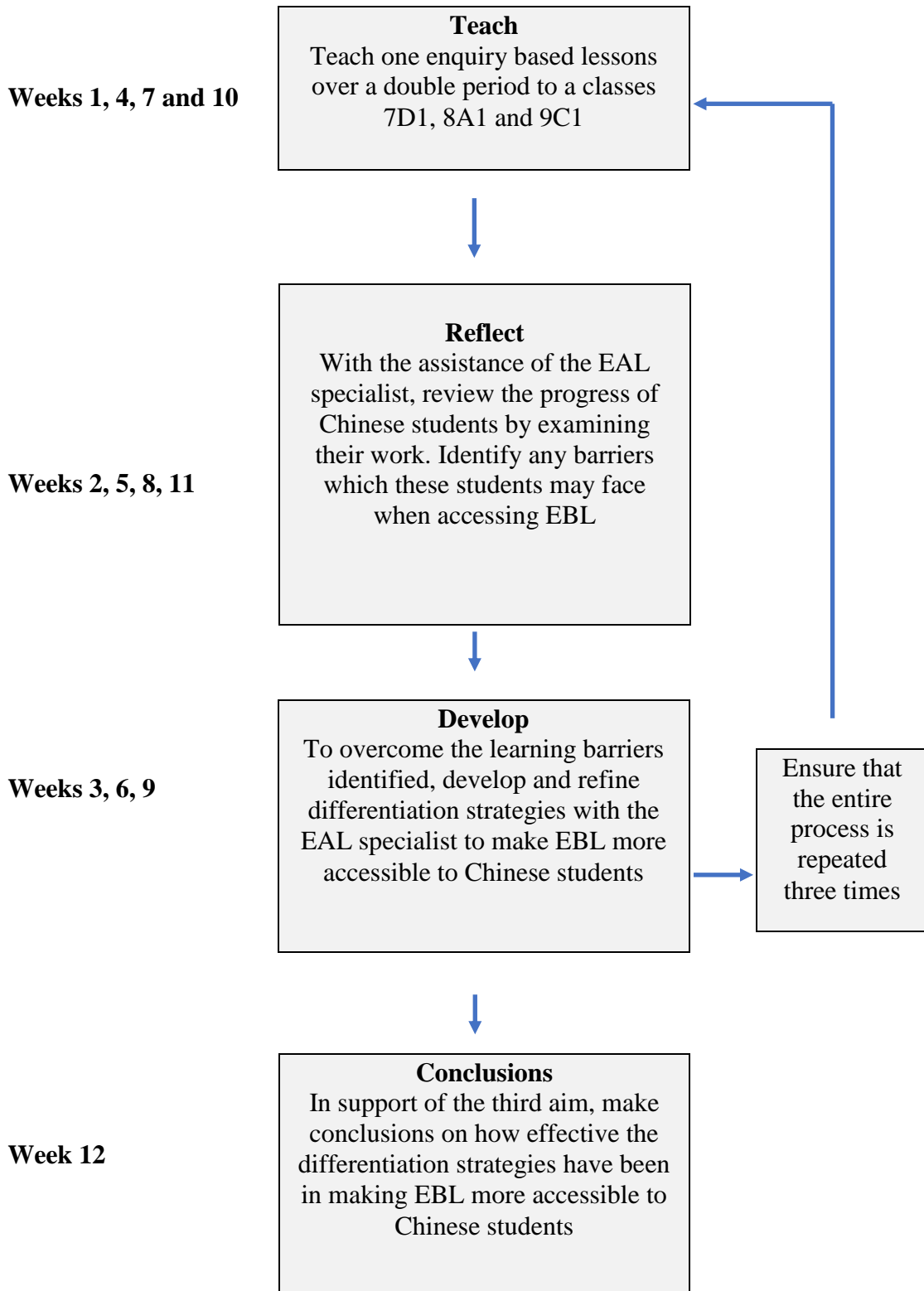**Diagram Explaining the Action Research Cycles over a Twelve Week Period**

Weeks 1, 4, 7 and 10

> **Teach**
> Teach one enquiry based lessons over a double period to a classes 7D1, 8A1 and 9C1

Weeks 2, 5, 8, 11

> **Reflect**
> With the assistance of the EAL specialist, review the progress of Chinese students by examining their work. Identify any barriers which these students may face when accessing EBL

Weeks 3, 6, 9

> **Develop**
> To overcome the learning barriers identified, develop and refine differentiation strategies with the EAL specialist to make EBL more accessible to Chinese students

> Ensure that the entire process is repeated three times

Week 12

> **Conclusions**
> In support of the third aim, make conclusions on how effective the differentiation strategies have been in making EBL more accessible to Chinese students

Figure 3

3.2.2. Analysis of Action Research Cycles Data

A constant comparative method was used to compare and analyse the students' work at the end of each research cycle.

To analyse the effectiveness of each of the differentiation strategies, the Chinese students work was analysed and the effectiveness of each strategy was given a score out of four.

The description levels were:

4=Substantial evidence of strategies reducing barriers
3=Reasonable evidence of strategies reducing barriers
2=Limited evidence of strategies reducing barriers
1=No evidence of strategies reducing barriers

3.3 Classroom Observations

Thomas recognised that 'observation is one of the most important ways of collecting data in social research' (Thomas, 2017: 226). To support Thomas's claim and the action research cycles, four of my taught year eight lessons were observed by the EAL specialist. These observations aimed to identify learning barriers and monitor the effectiveness of the differentiation strategies.

The EAL specialist involved with my study is employed by the school to work with all students who do not speak English as their first language. Their role is to improve students understanding and communication in both written and spoken use of the English language. Despite working with numerous nationalities, the EAL specialist is most experienced at dealing with Chinese students having worked for five years in

Mainland China teaching English. This has given her a good insight into how Chinese students learn. They were willing to participate in this investigation as it could lead to all students being able to access lessons more effectively and ultimately improving their levels of attainment.

The initial intention was for all of my taught lessons to be observed by the EAL specialist teacher, to identify any learning barriers and closely monitor the effectiveness of the differentiation strategies, which were developed. However, due to timetabling constraints and the restricted availability of the only EAL specialist employed in the school, it was not possible to have all lessons observed. By being observed teaching a single year group multiple times, it helped identify to what extent the applied differentiation strategies had been effective and how they can be further developed. These observations enabled me to 'look afresh at everyday behaviour that otherwise might be taken for granted or go unnoticed' (Cooper and Schindler, 2001: 374).

The observation took a structured approach, where my teaching practice was observed in relation to the investigations aims. Cohen *et al*. claim the benefits of a structured observation is that it is 'very systematic and enables the researcher to generate numerical data from observations' (Cohen *et al*. 2011: 459). To facilitate this I created an observation form, which was given to the EAL specialist before the lesson (appendix 4). This form is a refined version of the school's official lesson observation form and tailored to solve the investigations aims. The data from these observations was analysed qualitatively.

3.4 Ethical Considerations

This investigation was conducted within the guidelines of The British Educational Research Association Ethical Guidelines for Educational Research. I have also obtained

ethical approval from The Departmental Research Ethics Committee based at the University of Oxford to undertake this study. Prior to conducting any research, full consent was obtained from the school's headmistress. No student was individually identifiable from the research and before any data was collected all students were made aware of the aims of the investigation, through me reading them a written statement. Although given the opportunity to opt out of the study, all the students chose to participate.

All of the data collected was stored securely and confidentially in a locked filing cabinet. This included completed activities, classroom observations data, digital recordings and transcriptions of interviews. All paperwork will be safely destroyed and digital recordings permanently erased upon submission of this study.

In relation to practitioner based research Newby recognised 'the practitioner is also the researcher, and may not be entirely disinterested' (Newby, 2010: 64). This suggests that when reviewing and implementing change to the research cycles the researcher, might take actions, which give them the results, which they desire. Having an independent observer reduced this risk.

This investigation focused solely on Chinese students, which excluded other EAL groups and students who may require support. To make the investigation more inclusive, all students were offered the differentiated resources, which were developed for the Chinese students. There is the possibility that these strategies may not have been effective for other EAL groups or students because the Chinese students have specific learning needs. However, the strategies could be adapted to meet the other student's needs.

Cohen *et al*. (2011) identifies that, observations have their limitations, which may lead to biased results. These include the selective attention of the observer and reactivity where the students may change their behaviour because there is an observer present. This investigation required the EAL specialist to focuses her observations on the Chinese students. However, further observations could be conducted into the learning of other EAL groups. To encourage the students to relax and behave as normal, all students were informed before the observation that they were not being formally accessed.

The observer's results may be impacted by personal judgement and selective memory where they write up their findings formally after the observation, resulting in the loss of some qualitative data. To reduce the likelihood of this occurring, the EAL specialist was given the observation form before the lesson with the intention that they would be able to complete the majority of it during the lesson.

I work well with the observer and it is in both our interests to demonstrate that the Chinese students are making good progress meaning that they may be biased in giving me positive feedback. The observer is aware of the aims of the investigation, which may formulate pre-conditioned expectations and lead to biased results. The results would have been more reliable and perhaps offer a different view if there was more than one person observing. Due to there being only one EAL specialist in the school, this was not possible.

Asking the students to work in groups was not appropriate for this investigation. Past observations made me aware that Chinese students find the experience daunting and the enquiry process is dominated by the personalities of the British students, restricting the Chinese students' access to the enquiry process. It was considered that the Chinese students could all work together in their own group, however experience showed that if

this occurred they are likely to communicate in their first language. When this happens, little is completed; it is assumed that the students go off topic. Solely grouping the Chinese students together would also be against the school's policy and would not be inclusive of other students.

3.5 Limitations of Methodology

The primary interview data was dependent upon the students' responses. Rink (1998) claims that it is important to offer students autonomy and listen to what they have to say, but this can create the potential for students to give unreliable or insufficient answers. Furthermore, the data collected could be biased. There is a possibility that the students gave positive responses to please myself as their regular classroom teacher. Students might have also offered positive answers in order to look intelligent. If an unfamiliar teacher had conducted the interviews, there is the potential for the results to be less positive and more honest.

Zuber-Skerritt (1996) has been critical of action research cycles challenging how true progress or understanding can be made when research cycles are often limited in terms of time. She further claims that the process is not vigorous enough and questions whether the time and energy the process takes does truly lead to genuine improvement and understanding. To give a more reliable representation of a students' progress, the investigation should be conducted over a longer time period. Twelve weeks was not enough time to determine if the differentiation strategies had been truly effective. To determine if the differentiation strategies have truly been effective, students' progress should be monitored from the start of year seven to the end of year nine. A longer research cycle might have led to the identification of additional learning barriers. It would have also allowed space for different enquiry based activities to be incorporated

into the lessons. The application of different activities might have led to additional learning barriers being identified. This would have led to the development of new differentiation strategies.

The students' motivation and progress during the observations might have been influenced by the time of day that they took place. All observations took place on a Friday, which may have given different results to observations conducted for example on a Monday morning. Students' progress might have also been influenced by a variety of other factors, such as what may have happened in the previous lesson, or whether the day is particularly hot or cold, hence leading to biased results. It is important not to make assumptions regarding what is being observed. The students may look disengaged from their work when in truth they may be thinking. All actions were taken to limit the amount of bias in this investigation.

There may be additional barriers to learning, which were not identified, in the initial observation by the EAL specialist. At the time of observation (February 2018), the majority of the students in the class had experienced at least six months of EBL. If the observation had taken place at the start of year eight, additional barriers to learning may have been identified. In addition, although the majority of Chinese students enrolled at the school at the start of year seven, there were a limited number who enrolled at a later date, for example, at the start of year eight. This meant that some students had a greater exposure to EBL than others. Potentially this could have resulted in them having fewer learning barriers. Finally, this study does not account for different intelligence levels, which will impact the results both academically and emotionally.

4. FINDINGS

4.1 Analysis of Initial Interview with Chinese Students

All students claimed they did not find studying geography particularly difficult. It was encouraging that they displayed such confidence, however this was not reflected consistently in their grades, meaning that this claim was unreliable. Perhaps, the students were keen to impress me and were reluctant to give a negative answer. This was a limitation of the students being interviewed by their regular classroom teacher. If someone they were unfamiliar with interviewed the students, they may have offered more honest answers. It is also possible that students might not be aware that they are not achieving what is expected of them in geography.

Student 9A offered the most insightful answer, claiming they found it hard to remember key geographical words, but they also felt it helped to improve their English. Whilst student 8B also struggled with this, student 8D recognised that they found places hard to remember. Students are not assessed on their ability to remember places, rather the geographical processes which occur within them. I was therefore unsure why the students identified this as a challenge. Student 9A responded that the noise within the classroom made lessons difficult. This could refer to the open-ended nature of enquiry, where students are encouraged to discuss answers. However, in this instance they were referring to how noisy British students can be.

Student 8B stated that they found geography difficult as the world is so large making it hard to know all of the concepts. However, they also felt that through repetition they might be able to learn new places. Student 8D claimed that because they had never visited the places studied in the lessons, they find it difficult to learn about them. Student 8A claimed that they do not understand geographical processes which is an

aspect of geography all students can find challenging. Interestingly, not one of the students identified the open-ended nature of EBL as a challenge. It is possible that they were unaware that this barrier was present.

Student 8B identified that geography lessons are unique from other subjects as I used videos to support learning. Student 9A identified that geography is unique because it involved class discussions. This is an attribute of EBL, highlighting that students recognised EAL is different to other ways of learning. They compared this to their experience of learning in China where they were required to learn through repetition. Student 8D claimed that I "open the window to make me easily to learn". This referred to the current differentiation strategies I applied, which are general strategies suitable for SEN students.

Student 8B recognised that the investigative approach to geography made it enjoyable. Cheng (2004) proposed that, the Chinese education system does not foster creativity and Tan (1999) claimed that it is the teacher's job to facilitate it. I therefore made an effort to facilitate a creative lesson, and the student responded positively. It is important to build on this enthusiasm and develop strategies to help the students access the lessons. Helms (2015) viewed that, skills like creativity can be learnt. Students 8B, 8D and 9A enjoyed the discussion aspect of geography, which was surprising, as Chinese students often do not conduct themselves effectively when it comes to class discussions, rarely if ever contributing ideas. However, student 9A recognised this as an area of weakness and wanted to improve on it. This does support Vita's (2000) proposals for collaborative learning in the form of discussion. Student 8B claimed that they would like to work with their friends whilst Student 8A enjoyed geography because the lessons allowed them to

compete with their peers. This is an also an unexpected claim, as the Chinese students are rarely successful on academic grounds when competing with their peers.

Student 9A stated that a 'help sheet' in the form of a differentiated sheet would be beneficial, again supporting Theodoridis's (2015) suggestions that students should be offered key words sheets or writing frames. There were many points during the interview when the students were hesitant to answer, such as question five. This was an example of the confidence barrier and evidence of Huang's (2005) claim that for Chinese students, answering back to a teacher is seen as disrespectful. However once one student had answered, the rest were keen to contribute.

In summary, the students identified lexical barriers as being the main reason why they struggle to access EBL. The students identified that accessing EBL could be made easier if they were given key words, a differentiated help sheet and were allowed to work with partners and more class discussions.

4.2 Research Cycle One – No additional strategies applied

4.2.1 Findings from class 7D1's initial taught lesson (unobserved)

The students watched the video, but failed to complete the written task. To investigate Mercer's (2000) claim that students should take a more active and vocal role in the classroom, the class were set a class discussion task. The task was inaccessible to the Chinese students. When asked, what they thought, they remained silent or in the instance of student 7A stated "someone else", thereby avoiding the question. The barriers present were lexical, lack of confidence reluctance to ask questions and understanding of spoken language.

The final task required students to categorise a series of statements in order of importance, and to explain their answers in written form. Appendix 5 shows that student 7B was unable to access the task. The other students also had little success. Although all students did attempt the task and put the statements into order, they made little logical sense and the students were unable to justify why they made these decisions. The barriers were lexical, reading speed and reluctance to ask questions. The task had no prescribed answer, which supports Bond's (1991) claim that Chinese students may struggle in a scenario where there are no set answers. More barriers were identified in this year seven class than in the year eight class. This is to be expected as when Chinese students first arrive in England, it is often at the start of year seven and is not only their first experience of speaking English abroad, but also their first experience of EBL.

4.2.2 Findings from class 8A1's initial taught lesson (observed)

Student 8A struggled to access the atlas investigation activity (appendix 6). Here the unfamiliar vocabulary of the task acted as a lexical barrier. Words such as 'elevation' are not commonly used and have multiple meanings, making understanding the question challenging. Student 8B struggled with reading speed, which meant that they were only able to answer the first two questions (appendix 7). This affected their confidence and all students were reluctant to ask questions. The fact that student 8B completed the early stages of the task suggested that they understood my verbal instruction and comprehended the task. This highlighted the problem of lexical barriers and slow reading speeds. Answers six and seven from student 8B should be excluded as they were written after I read the answers out at the end of the lesson.

Three of the five students completed the sequencing task effectively. Student 8C struggled to sequence the statements (appendix 8) and their slow reading speed acted as

a barrier. An interesting result came from student 8D, who when given the sequencing activity, rather than cut out the statements, simply stuck the sheet into the book and then with confidence attempted to write on the sheet in Mandarin. Here both comprehension of the task and understanding of the teacher's spoken language presented themselves as barriers. I cut the statements out for the student and modelled the task. I then stepped back and let the student attempt the task. They quickly gave up.

Student 8D attempted most of the questions, but answered in Mandarin (appendix 9). This made it challenging to access and proposed another concept that perhaps the students are able to learn effectively by EBL, but only feel comfortable in doing so, in their first language. Under the school's policy all students must answer in English, however if the students were allowed to initially answer in Mandarin, they might be more willing to participate in the enquiry process. Once the students have developed the skills required of EBL in their first language, this could then be developed into answering in English. The greatest challenge of this would be assessing the initial answers. Few teachers in the school, including myself have the ability to assess work in written Mandarin. Alternatively, the students could be asked to read what they have written, but with an average of five Chinese students in each class and a series of activities to complete every lesson, this would not realistically be possible. It would also be challenging to mediate class talk and determine if the students are on task.

4.2.3 Initial observation of class 8A1 by EAL specialist

Six initial barriers (appendix 10) to learning were identified:

1. Lexical

2. Reading speed

3. Lack of confidence

4. Reluctance to ask questions

5. Understanding of spoken language

6. Comprehension of tasks

The first barrier identified was lexical or lack of vocabulary. If a students' level of English vocabulary is low, it restricts them from being able to communicate their answers verbally and on paper. Reading speed was a continuous barrier throughout the enquiry process. This was emphasised when the students were asked to use an atlas to find Dorset. The students were slow when checking a word resulting in many of them being unable to complete the task within the time frame. Failure to complete initial tasks can impact students' ability to access later tasks. This dramatically affected the students' confidence and ability to fully access the lesson.

The Chinese students were reluctant to ask questions meant that when students were unsure of a task, they would not ask for help, remaining silent and even dismissing the task. This supports Huang's (2005) claim that in China, questioning a teacher is disrespectful. This could demonstrate a lack of confidence, where Chinese students perceive themselves as inferior to their English-speaking peers because of their inability to communicate English effectively. At times, the Chinese students did not entirely

understand what the teacher communicated verbally. This impacted on the students' comprehension and ability to access tasks.

4.2.4 Findings from class 9C1's initial taught lesson (unobserved)

The year nine Chinese students showed similar learning barriers to the year eight students. Students were initially set a categorising task, where they were required to read a series of statements and categorise them as economic, social or environmental factors. All Chinese students understood the task because they initially made good progress, suggesting that comprehension was not a barrier. However, many struggled to complete this task effectively. Student 9A was able to categorise the social effects (appendix 11) but took a long time in doing so, resulting in the non-completion of the task. The social effects, which were categorised, were also not all correct. Lexical and slow reading speed barriers were present for the all of the Chinese students. Despite this, all students attempted the task with a fair amount of confidence.

4.3 Research Cycle Two (using key words sheets, image analysis activity with multiple choice answer sheet and a differentiated writing frame)

4.3.1 Interventions for classes 7D1, 8A1 and 9C1 based on research cycle one

The first barrier to overcome was lexical. Geography lessons present students with terminology, which they would not use on a regular basis, for example stacks. Geography requires students to understand and effectively apply command words such as describe, explain and analyse the words presented in geography lessons often have double meanings. For example, in geographical terminology, the fetch is the length of open water over which a given wind blows. In a different context, this could involve retrieving an item. EBL requires students to understand and apply these words quickly

and effectively, making it challenging, resulting in students becoming isolated at the early stages of the enquiry process. To overcome this barrier and utilise Theodoridis's (2015) suggestion, a key word sheet was developed to support the students learning. The intention was to give this sheet to the students prior to the lesson. Teachers should additionally verbally apply these key words and any command words effectively to different scenarios, whilst consistently repeating them to help the students understand what they mean. This should help the Chinese students who struggle with processing information at speed. These differentiation strategies were also developed in response to Crose's (2011) claims that teachers should adapt their lessons to suit the needs of their students.

The importance of visual aids was recognised. This can be in the form of pictures or images, acting as a visual guide to connect the students' thoughts and guide them through the enquiry process. For example, when studying coastal landforms, students could be given pictures of landforms with the name written next to it. If possible coastal landforms in China could be used, for example the stacks off the coast of Dalian, China. This could connect students' thoughts to their home surroundings and motivate them to work through the enquiry process. As Edelson (1999) recognises it is important to manage the enquiry process with suitable resources. This should increase students' motivation and enable them to participate in the enquiry process with greater confidence, hence reducing this barrier. To assist students in translating, they were provided with a translation dictionary. To further emphasise, the importance of visual aids, all students were shown a video. They were informed that the video would be played twice and that they should complete the task after the second video. Watching the video twice helped the students familiarise themselves with the key themes making it more accessible.

In support of scaffolded learning theory, I modelled tasks before the students attempted them. This enabled the students to see what was expected of them and helped to reduce any lexical or understanding of spoken language barriers. EBL involves learning through a series of tasks and methods, which the Chinese students are not familiar with, so it is important that each task is effectively modelled if students are going to be able to access them. After this initial modelling, teachers should offer students regular support and if necessary repeatedly model instructions in different ways. Once students can fully comprehend different EBL tasks, they should find accessing lessons easier.

As recognised by Barnes and Scoffham (2017), collaborative learning is an essential attribute of EBL, which can lead to greater creativity. For the duration of the research cycle, all Chinese students were paired with suitable British students, who were patient, receptive and keen to work with others. The intention was that any discussion between the two students might help reduce lexical and comprehension barriers which the Chinese students had, and develop their confidence. The partners acted as a supporting figure and role model. Initially as recommended by Vita (2000) it was considered that Chinese students could be paired with other Chinese students. However, to restrict any off-topic conversation, it was concluded that they should be partnered with British students. This allowed them to practice their English and to comprehend tasks. To encourage conversation between the pairs, I ensured that the classroom was laid out in a format, which enabled the students to converse easily. This action was taken in response to Zhang *et al.'s* (2005) research, where desks in the classroom were facing the front, hence restricting the enquiry process.

Specialised differentiated resources were developed for all Chinese students. Key words sheets were given to the students at the start of the lesson. To support a constructivist

approach to learning, an image analysis task was incorporated into the lesson where students were required to move around the room and analyse images to determine the different threats to the coral reef. It was written in response to Vita's (2000) claim that tasks, which rely on the understanding of spoken word, should be reduced. To reduce any further lexical barriers and overcome any reading speed barriers, the Chinese students were offered a sheet, which gave multiple answers and required them to circle the correct one. The wording on this sheet was simple to allow students to understand the vocabulary and reduce lexical and reading speed barriers. Finally, students were asked to write a letter highlighting the main threats to the reef and argue whether or not they feel that the proposed solution is suitable. To investigate Theodoridis's (2015) research, students' learning was supported using a scaffolding approach. This was achieved by offering students a writing frame and a list of key words, which they could use to complete the task.

The barriers which student 8D presented were challenging. I felt that it was important to respect Theodoridis's (2015) claim and get to know the student. I spoke to the student individually about the importance of answering in English. It became clear that student 8D writes over tasks and offers answers in Mandarin because they are trying to translate words. The key word sheet and definitions should have helped, but it was agreed that if this technique assisted the student in accessing the enquiry, then I was satisfied for this to continue. However, it was also agreed that any formal written answers should be in English. This supported Crose's (2011) claims that teachers should adapt their lessons to suit the needs of their students.

4.3.2 Findings from class 7D1's second taught lesson (unobserved)

The majority of students were aware of how they could use the key word sheet to make the lesson more accessible. For the first image analysis activity, students were required to walk around the room and identify weather measuring instruments and what they measured. The Chinese students were given a multiple answer sheet and were expected to circle the correct answer. All students demonstrated a good comprehension of the task and approached it with confidence, supporting Vita's (2000) claim that students should be set active tasks. However, all students got at least three out of nine answers incorrect (appendix 12). This task was particularly challenging, and might have been better suited to year nine students. In this instance, the differentiated resources had a limited effect in reducing any lexical and reading speed barriers.

All Chinese students found the next activity equally difficult. They were required to choose two of the weather measuring instruments and write down the advantages and disadvantages of each. To test Crose's (2011) theory, students were provided with a guide sheet offering them a model answer, however despite these efforts, no students completed the task. This was demonstrated by Student 7A (appendix 13). With the presence of lexical and reading speed barriers, this task was unmanageable to complete within the allotted time. This led me to consider that it might be more beneficial if the Chinese students completed fewer tasks, but demonstrated a full understanding of each one. Thereby supporting Roberts (2013) claim that geographical enquiry requires more classroom time.

4.3.3 Findings from class 8A1's second taught lesson (observed)

All of the differentiation strategies were effective to a certain extent. The most effective was the multiple-choice image analysis activity. All of the Chinese students found that the supporting worksheet made the image analysis task accessible. They were able to identify the threats however the majority of students were unable to explain the threat in sufficient detail. Student 8B achieved this, whilst student 8D failed to attempt that part of the worksheet (appendix 14). This suggests that lexical and reading speed barriers are still present.

The writing frame and images were useful in supporting the students when watching the video (appendix 15). Upon reflection, it became clear that students would struggle to complete the writing task, which followed, because they had not fully grasped the previous one. Time management was not the only issue, student 8C struggled to apply key words effectively and offer valid answers (appendix 16). Throughout the lesson the students were reluctant to ask questions and displayed a lack of confidence in their work. I observed that the students were not referring to the key words, which they were issued at the start of the lesson. In fact, the absence of these key words from the students work, suggests that they may not be aware of how they could use them to support their learning. Overall, the differentiation strategies had little effect in reducing the learning barriers. The applied differentiation strategies failed to improve students' confidence and encourage them to ask questions. Furthermore, the students' slow progress on the tasks suggested that reading speed was still a barrier.

4.3.4 Second observation of class 8A1 by EAL specialist

The key words were useful and most students referred to these consistently throughout the enquiry process, proving that Theodoridis's (2015) claim is accurate. To help reduce lexical barriers and barriers associated with the understanding of spoken language, I frequently asked British students to repeat instructions back to me. This was followed by asking the Chinese students to repeat my instructions. This method ensured that I did not put too much pressure on the Chinese students whilst still ensuring that they could comprehend tasks.

The image analysis activity was effectively modelled and acted as "excellent visual aids". The task helped to reduce lexical, reading speed and understanding of spoken language barriers. In addition to this, all Chinese students comprehended the task. The pairings with British students supported this activity and others. The pairings were a "great strategy" and the EAL specialist observed that the students "learnt a lot from each other e.g. buddy explaining how to spell 'anchor'". This was an example of how lexical barriers can be reduced. This proved that Vita's (2000) research of paired work should be recognised. It was also encouraging that the Chinese students were asking British students' questions. Supporting Huang's (2005) argument that Chinese students do not have the confidence to ask the teacher questions because this is seen as disrespectful. However, they can learn through EBL by questioning their peers.

Even with these differentiated resources, the students found the letter task challenging and all had limited success with it, suggesting that lexical and reading speed barriers were still present. Furthermore, the students demonstrated a lack of confidence. Overcoming barriers such as a lack of confidence and reluctance to ask questions is challenging. To overcome this issue, Crose (2011) identifies that students should be

made to feel more comfortable in class. This can be achieved through gaining the support of all of their peers, which is why effective pairing is important. It should be recognised that it will take time for the students to truly feel comfortable and for their confidence to grow. Once the students are comfortable working in their pairs, group work can then be introduced, which should create a more inclusive environment helping the students' confidence to develop. Vita's (2000) claim that a teacher can raise students' confidence by getting to know them, will also take time.

It was identified that the success of the visual aids could be developed further. Students watched the video clip but did not fully understand the concepts. The students also struggled to keep up with the spoken language and differing accents in the video. Here reading speed, lexical and understanding of spoken language barriers were present. These barriers could be reduced by applying Mandarin subtitles to the video. To differentiate the video further, teachers could write key words and their definitions, which appear, on the video on a white board whilst the video is playing.

After this second observation, I was informed that student 8D was being assessed by professionals to determine their precise Special Educational Needs (SEN). This student struggles with deeper issues than basic EAL barriers but at this stage the school are not entirely sure what these needs are. SEN are often not recognised in China, which means that when students enrol at the school, there are no records.

4.3.5 Findings from class 9C1's second taught lesson (unobserved)

The interactive image analysis activity was made accessible by the multiple-choice sheet where students were required to circle the correct answer. The wording on this sheet was basic, taking into account the students slow reading speed and lexical barriers.

All students comprehended the task and used the differentiated resources to complete the activity effectively, supporting Vita's (2000) claim that tasks should be active. Appendix 17, shows that Student 9B had a clear understanding, and managed to get all of the answers correct. This accessible task was given to the students earlier on in the lesson to build their confidence. The next task was more challenging.

Students were asked to write a debate considering the positive and negative effects of extreme tourism. They were offered a writing frame with simple wording and an additional sheet with good and bad points highlighted to assist their arguments. All students understood the task and attempted it, suggesting that barriers such as comprehension of task and understanding of spoken language were not an issue. However, no student managed to complete the task. Time management presented itself as barrier. Appendix 18 shows that student 9A started the task and offered reliable answers but failed to complete the task. This combined with the similar outcome in the year seven class suggests that the tasks, which I am giving the Chinese students, might be too demanding for the time allowance given. Helms (2015) claimed that students could learn the skills required for EBL in time. It might be more beneficial for the Chinese students' academic development and confidence if they completed fewer tasks, but completed them in full. Throughout the lesson, the Chinese students did not ask questions resulting in the fourth barrier still being present.

A Comparison of the Effectiveness of the Differentiation Strategies Applied to the Second Taught Lessons
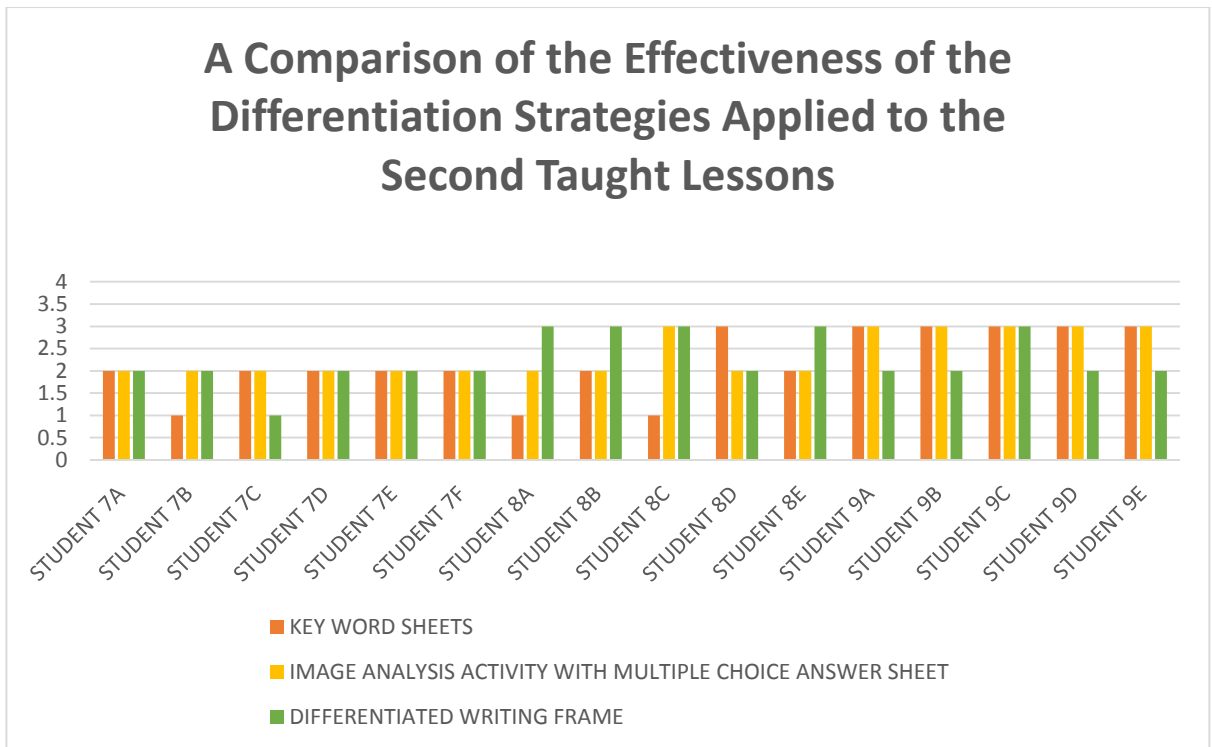
Figure 4

Figure four shows that the older the students, the more effective the strategies. This could be because they have already experienced EBL for a longer period of time and are were more aware of how they can use the strategies to reduce the barriers.

4.4 Research Cycle Three (adding images to key word sheets, post-it's, image sorting activity and incorporating images into differentiated writing frame)

4.4.1 Interventions for classes 7D1, 8A1 and 9C1 based on research cycle two

Images were added to the key word sheets to help the Chinese students to connect the words to images (appendix 19). Taking Theodoridis's (2015) initial idea and developing it further. The intention was to improve the students' geographical vocabulary and reduce lexical barriers. The addition of images also enabled students who could not read well. For the third research cycle, I ensured that I offered these sheets to the students in advance with the intention that they would arrive at the lesson with a basic knowledge of the terminology.

To utilise the students' ability to work effectively with images, all text heavy activities were adapted to incorporate images. For example, all students in class 8A1 were required to read through a series of statements and categorise them. These were adapted for the Chinese students who were offered a series of images to sort and categorise. Additionally, images were added to all writing frames making them more accessible. To overcome the issue of Chinese students' not completing the tasks, they were made more manageable in size. An example of this is that Chinese students were asked to write down one advantage and one disadvantage, rather than three of each. Targets can be increased as the students become more confident and find the tasks accessible.

To overcome the barrier of the students' reluctance to ask questions, and to improve their confidence, a strategy involving post-it's was adopted. At the start of each lesson, students were shown an image and required to ask a series of questions. Chinese students were reluctant to participate in this activity. As recognised by Huang (2005) asking questions or debating with a teacher is seen as disrespectful in China. To overcome this, each student was given a post-it and encouraged to write down at least three questions they would like to ask. They were instructed to not write their name on the post-it. This allowed the Chinese students to express themselves without being concerned over their ability to communicate. It also kept the students' identities anonymous from the teacher. The post-it's were collected in and a selection read out. As students become more confident, culturally aware and willing to ask questions in written form, this technique can be withdrawn and students encouraged to ask questions verbally.

4.4.2 Findings from class 7D1's third taught lesson (unobserved)

The post-it notes were effective in motivating students to ask questions. However, students took a long time to grasp the activity and write down suitable questions. It is possible that the year seven students still viewed this task as challenging the authority of the teacher, as recognised by Huang (2005). After some hesitation and encouragement from myself, the students successfully completed the task. Initially the image sorting activity got off to a slow start and despite being given the key words in advance, all of the Chinese students struggled to understand what economic and social meant. Student 7D found this task to be particularly challenging and was unable to complete the task (appendix 20). I explained the terms, but ultimately this lexical barrier limited the students' success on the task. This task had limited prescribed answers, where some of the cards could be placed in more than one category. As identified by Bond (1991), the Chinese students did find this task daunting, resulting in them taking a long time to complete it. Situations where there are no prescribed answers appear to affect the students' confidence and motivation.

The next written task was not a success. Even with the assistance of a writing frame, many students did not even attempt it. Student 7E was unable to complete the task. There were no prescribed answers, requiring the students to choose what they believe were the three worst effects and justify them. It appeared that the students' failure to comprehend the previous task impacted upon their attainment. Better results may have been achieved if students completed fewer tasks, whilst investing more time in completing these in sufficient detail, demonstrating that they had truly mastered the basics. This might lead to improved satisfaction and confidence. As the students' ability to master these tasks improves, then they can be presented with more challenging tasks.

4.4.3 Findings from class 8A1's third taught lesson (observed)

The post-it task was successful in encouraging the Chinese students to ask questions. All of the students wrote down at least one valid question (appendix 21). This differentiation strategy encouraged students to ask questions effectively.

The image analysis task engaged the students and effective pairing made the task more accessible. They worked well in their pairs, discussing the answers and effectively completing the task, supporting Vita's (2000) views for collaborative learning. Most students comprehended the task, although only two students got all the answers correct (appendix 22). The task was demanding and required students to analyse a large number of images. These images could be placed into numerous categories, meaning that there was no prescribed answer. This presented itself as an additional barrier and offered more evidence that Bond's (1991) research claim that Chinese students might struggle in a situation where there are no prescribed answers is accurate.

The following written activity was less successful. All students attempted the task but had varying levels of success. Students were required to explain the main reasons for visiting the island of St Martin. All Chinese students were given a writing frame, which incorporated a sketch box, enabling students to connect their thoughts by sketching an answer before offering it in writing. This writing frame aimed to reduce lexical and reading speed barriers. Student 8B and 8C demonstrated a clear understanding of the task and despite insufficient drawing, was able to write effective answers (appendix 23). Student 8D offered a limited understanding of the task, offering only basic answers (appendix 24). In this instance, the drawing box had little benefit. Despite my attempts to make the tasks more manageable, all students struggled to complete the tasks in the allotted time frame.

4.4.4 Third observation of class 8A1 by EAL specialist

Although the students had been given the key words in advance, it was evident that few had taken the time to look at them. The image sorting activity was effective in reducing reading speed barriers, however it did not support the students in improving their reading speed, meaning ultimately that the barrier was not overcome. The EAL specialist suggested that the image sorting activity combined with a few sentences might be more beneficial. She also observed that the barrier of improving the students' lack of confidence has not been sufficiently addressed. It was additionally recognised that some of the tasks, in particular the written ones which come towards the end of the lesson were not manageable.

4.4.5 Findings from class 9C1's third taught lesson (unobserved)

The post-it notes were effective in encouraging students to ask questions and the key words reasonably reduced lexical and reading barriers. All of the Chinese students comprehended the sorting activity and it was made more accessible by the use of images, which were effective in reducing lexical and reading barriers. However, the task did require an initial extra explanation from myself, suggesting that the barriers of understanding spoken language and comprehension of tasks might still have been present. Students 9C and 9E, found this task challenging, mainly due to there not being a prescribed answer (appendix 25).

The Chinese students had varying levels of success on the written task. Despite some of their answers being written in an abstract way, Student 9A demonstrated an understanding of the task and offered reliable answers. The answers offered by student 9C and 9E, were less reliable. This was because they failed to complete the previous

task, restricting their ability to access this one. Despite my attempts to make the task more manageable, most students offered only two out of three reasons why they believed that ecotourism was good or bad instead of the suggested three. However, despite not offering the suggested number of reasons, the two offered by student 9A were detailed (appendix 26).
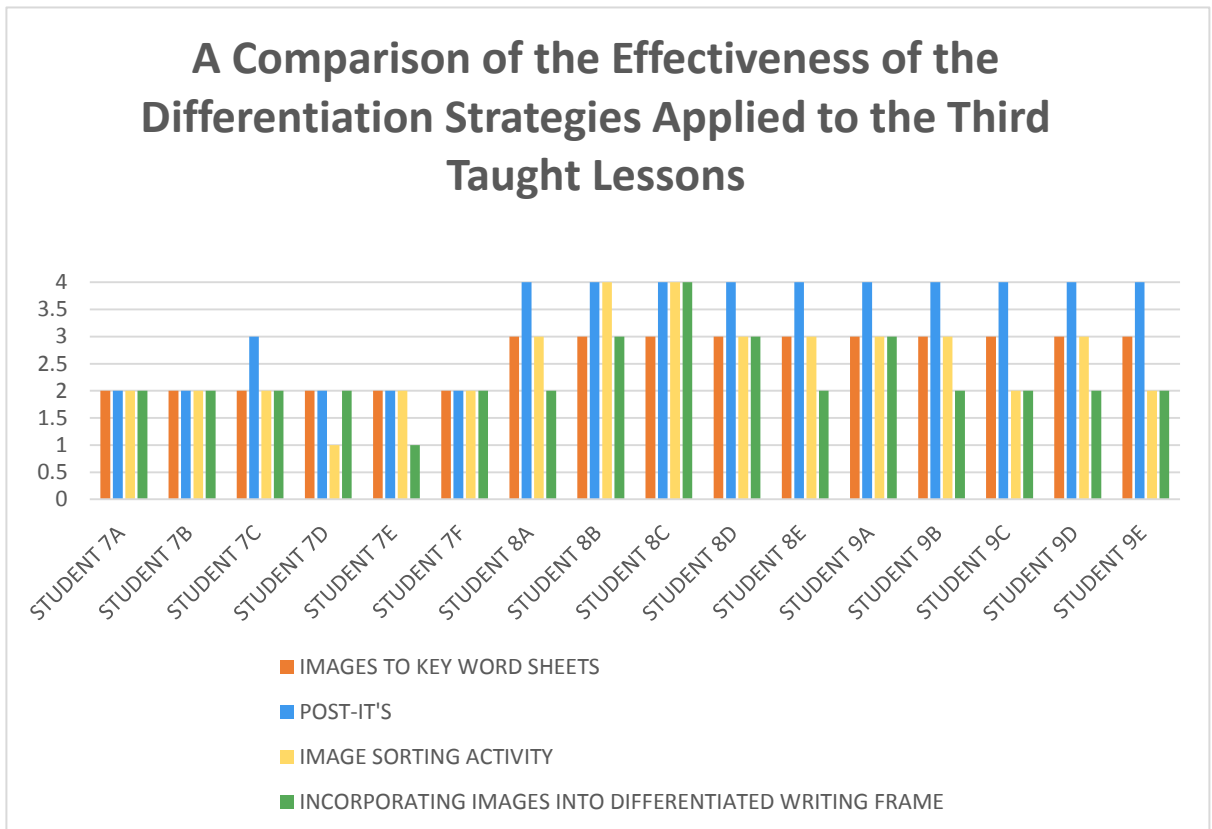
Figure 5

Figure five demonstrates the applied differentiation strategies had limited impact on the year seven students. The post-it's strategy showed substantial evidence in reducing barriers for the year eight and nine students.

4.5 Research Cycle Four (adding flipped learning task, partially completed and model answers)

4.5.1 Interventions for classes 7D1, 8A1 and 9C1 based on research cycle three

To overcome the fact that the students were unable to look at their key words before the lesson, a flipped learning task was developed. Simple information was given to the students to read which related to the lesson and its key terminology. Students were required to answer three questions, challenging their understanding of the information. This task aimed to reduce lexical and reading speed barriers, however in order for it to be effective it had to be presented to the students correctly. There was the potential for students to view this task as extra homework and a form of punishment. Prior to issuing this task, I explained to the Chinese students why they were being given the tasks and the benefits of completing them. The prepared differentiated resources were more manageable. For written activities students were required to offer two instead of three reasons, with a third reason being optional to motivate the more advanced students. In order to gain a true understanding of tasks, students were encouraged to complete one task before moving on, with no pressure to complete all tasks. This implementation was made in response to Roberts (2013) and Helms (2015) who claim that students need time to develop enquiry skills.

To help the Chinese students overcome the challenge of not always having a prescribed answer, model answers were given to year seven students, supporting Crose's (2011) suggestion. These are exemplar answers, which the students could use to formulate effective answers. All students were also offered semi-completed answers to get them started and help them to formulate a suitable answer. These strategies should reduce lexical and reading speed barriers. Model answers were not given to year eight and nine

students because it was not appropriate for the activity. However, they were given a partially completed answer.

The EAL specialist recommended that to help improve the Chinese students' confidence, they could be asked to contribute something unique to the lesson. They could use an example from their home country, which they will know but their British peers will not. For example, The Spratly Islands in the South China Sea are home to Coral Reefs. This would support Crose's (2011) idea of an inclusive classroom.

4.5.2 Findings from class 7D1's fourth taught lesson (unobserved)

The flipped learning task was only beneficial to students' 7B and 7D, as the rest of year seven students failed to complete the written task, which accompanied the short reading activity. The Chinese students effectively analysed different hurricane shelters and offered basic advantages and disadvantages for each. The following task required students to design their own hurricane shelters. Setting students, a creative task such as this, was a risk. As Dahlin and & Watkins (2000) recognised, in China creativity is seen as a slow process which requires effort and repetition. However, Tan (1999) believed that it is the teachers' job to facilitate creativity.

This was an open task with no prescribed answer. To assist the Chinese students, they were offered three model answers (appendix 27) and encouraged to study them for five minutes before attempting the task. Students were also given a partially completed answer (appendix 28), which required students to expand in places. The writing frame helped to guide the students where there were no prescribed answers. It also aimed to reduce any lexical, reading speed and comprehension barriers. This proved to be effective, with all students offering basic but accurate designs. The tasks, which the year

seven Chinese students completed, suggested that they can be creative, but may not be as proficient as their British peers. This can be put down to the exam-orientated system in China, which does not promote creativity as identified by Schmitz (2011). Schmitz's (2011) claims are accurate, however as recognised by Helms (2015), students can learn these skills in time.

Students were asked to present their ideas to the class. I was aware that the Chinese students would find this task daunting and might put up some resistance. To counter this, I allowed all students to present in pairs. Students presented their own hurricane shelter, but had a partner to help them to answer any questions the class might have. The pairings had previously proven effective and I hoped that this task would further raise the Chinese students' confidence.

The Chinese students presented their ideas, relying upon drawings to explain their designs. All of the students' designs and descriptions were basic, with their presentations being shorter than their British peers. However, it was encouraging that the Chinese students did have the confidence to present their ideas. Despite the pairings, all Chinese students were not very responsive to questioning, demonstrating that they require further support. The attainment of the Chinese students in this lesson was greater than previously. I believe that the model and partially completed answers were responsible for this.

4.5.3 Findings from class 8A1's fourth taught lesson (observed)

The post-it activity again proved successful in reducing the Chinese students' reluctance to ask questions. The partially completed task was effective in enabling the students to access the image sorting activity. All students placed the images into a logical order and

were able to formulate an idea as to why *Christiano left home* (appendix 29). The following task required students to consider what actions can be taken to improve favelas. Students were offered a writing frame, which incorporated the use of images. Student 8B offered accurate answers for all of the initial questions, and then after some hesitation, was able to explain with some degree of accuracy, how favelas can be improved (appendix 30). Student 8D used the images to offer accurate answers, but failed to attempt the later question (appendix 31). This was good progress for student 8D, who at the start of the research cycle either answered in Mandarin or failed to attempt tasks. Student 8E was the only Chinese student who did not complete all the tasks, suggesting that overall the tasks were manageable.

4.5.4 Fourth observation of class 8A1 by EAL specialist

The lesson pairings continued to work effectively to build the Chinese students' confidence. The EAL specialist observed that the partially completed answers supported the students when there were no prescribed answers and helped them to complete the task. Despite the success of the post-it activity, introduced in cycle three, the Chinese students were still reluctant to ask questions during the rest of the lesson, suggesting that confidence and cultural barriers still exist. The EAL specialist believes that this skill may take students longer to develop. She further recommended that to help build the Chinese students' confidence, I could ask them questions, which they will know the answer to or ask questions relating to China. Focusing on what the students may know could help them connect with the lesson, which may lead to them being more willing to ask questions. This supports Vita's (2000) claim that it is important that a teacher takes the time to get to know their students.

4.5.5 Findings from class 9C1's fourth taught lesson (unobserved)

The post-it activity was effective in enabling the Chinese students to ask questions. All students attempted the first task, which involved identifying the effects of mass tourism. The supporting images helped the students to access the task (appendix 32). All year nine students found the flipped learning task helpful. In particular students 9B and 9C who showed evidence that it was reasonably effective in reducing learning barriers.

Students had varying levels of success with the main written task. Student 9B offered reliable answers and completed the task in detail, whilst student 9A's attempts at the task were minimal (appendix 33). Initially I considered that student 9A found the task too challenging and that the partially completed answer had offered limited support. However, doodling on the students' page suggests that they were disengaged with the lesson. Student 9A's disengagement might be because the lesson was conducted near the end of the school year when students are generally not as attentive. Despite having limited benefit for student 9A, the partially completed answer was effective in reducing learning barriers students' 9B and 9C.
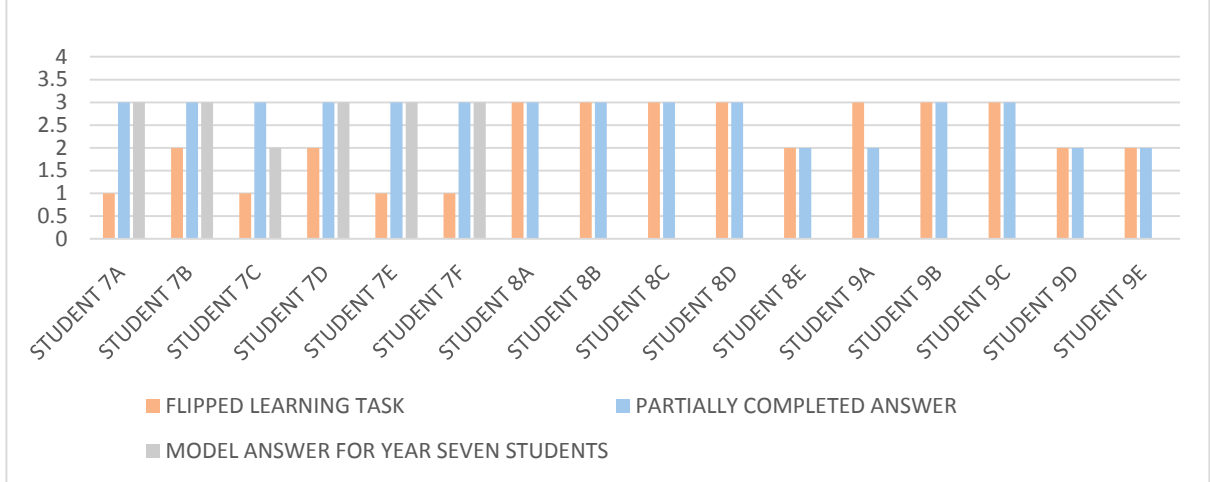
Figure 6

Figure six shows that the flipped learning task was not effective for the majority of the year seven students, because they failed to complete it. If they had completed this task, they might have found the other differentiation resources more useful and the lesson more accessible. However, the model answers were effective in supporting the year seven students. The partially completed answers were effective in supporting all students, particularly year seven and eight students.

4.6. Analysis of Final Interview

Only three out of four students now claimed that they found studying geography accessible. Following the research undertaken, it seems likely that the students were still keen to impress me and were afraid of giving a negative answer.

Student 8A, 8B and 8D claimed that they still found geographical vocabulary challenging as the words were new to them. Student 9A felt their lack of English acted as a barrier and stated that they struggled with the writing tasks. They claimed that even

if they are aware of the key words, and knew what they wanted to say, they struggled to communicate this effectively in written sentences.

Student 8A claimed that the main reason they found studying geography difficult is they struggle to imagine processes. This is an example of the students' lack of creativity. This was expected, because as Cheng (2004) found, creativity is not highly regarded in China. Student 8B recognised that the differentiated images have been effective in reducing these barriers.

Student 8B recognised that geography is unique. Student 8A developed the point further stating that teachers play a significant role in what makes lessons unique. Highlighting the respect, which the Chinese students have for teachers, and supporting Tan's (1999) claim that teachers can facilitate skills to students such as creativity. Student 9A reiterated that they enjoyed the discussion element of lessons. This was expected as the later stages of the research cycle suggested that students were more engaged in this aspect of lessons and were beginning to find it more accessible. This supports Vita's (2000) recommendation of incorporating an element of discussion. Student 9A stated that they enjoyed the image analysis activity where they were allowed to move around the room. Analysis of student 9A's work suggested that the multiple-choice help sheet made these tasks more accessible to them. This success might have led to greater enjoyment as student 9A claimed, "when I'm doing the questions I'm trying to like figure out, what's right and what's wrong". This referred to the categorising tasks, which were made more accessible to the students by the use of images, which led to a higher level of attainment.

In support of Vita (2000), student's 8B and 8D recognised the benefits of working with others. When asked if they believed that working with more people in a group would be

beneficial, both students' 8B and 8D stated that pairs were fine. To help make the lessons more accessible for them, Student 9A requested that I produce more help sheets, which were "very useful" in helping them access EBL. This was encouraging and shows that the differentiation strategies were effective. During this second interview, the students were not so hesitant to answer questions. This suggests a greater level of confidence and that they are beginning to overcome the barrier identified by Huang (2005), where questioning the teacher is seen as disrespectful. This is due to the students becoming familiar with the interview format.

In comparison to the initial interview, the Chinese students acknowledged that learning barriers were still present. The main barriers identified in the final interview were lack of creativity and lexical, suggesting they were still present. The Chinese students acknowledged that the differentiation strategies offered to them such, as multiple choice answers and paired work were supportive in overcoming these barriers. However, it will take time before the true effectiveness of the strategies can be measured.

5.0 CONCLUSIONS

My original investigation question '*to what extent are students from Mainland China able to access enquiry based learning (EBL) in a geography classroom in England?*' was answered by setting three aims.

5.1 Barriers to Learning

The first aim was '*to identify any barriers which students from Mainland China face when accessing EBL in geography*'. Barriers were identified which restrict the Chinese students from accessing EBL. The initial barriers were lexical, reading speed, lack of confidence, reluctance to ask questions, understanding of spoken language, comprehension of tasks and lack of creativity. During the investigation, additional barriers were also identified. These were that Chinese students struggled to manage the completion of tasks within the allocated time period and in situations where there were no prescribed answers. A combination of these barriers, restricted the Chinese students from being able to access EBL. By the effective application of specialised differentiated resources the barriers were reduced.

5.2 Developing Differentiation Strategies

The second aim was '*to develop differentiation strategies which assist students from Mainland China in overcoming these barriers to learning*' and the third aim of the investigation was '*to assess the effectiveness of these differentiation strategies*'. To overcome lexical and reading speed barriers, prior to every lesson students were given key word sheets with images incorporated. Some students effectively used these sheets, whilst others, particularly the year seven students, did not refer to them. To encourage the students in utilising these sheets, a flipped learning task was introduced. The year

eight and nine students completed this task effectively, however the majority of the year seven students failed to complete the task. This strategy proved to be ineffective for the year seven students and needs further adaption.

Images were incorporated into writing frames and key word sheets to help reduce lexical and reading speed barriers. Where possible tasks, which incorporated the use of images, were adopted. For example, students were given a series of images to analyse and/or sort. These image analysis tasks were successful, particularly when used in the initial stages of the enquiry process. They enabled the Chinese students to develop a basic knowledge before moving on to more challenging activities. However, at times, these tasks presented the challenge of not having one prescribed answer. The Chinese students found it difficult in these situations. This confirmed Bond's (1991) research. To help reduce this barrier, students were given partially completed answers, which acted as starter activities and enabled students to see different ways of answering the question. When this strategy was applied, students were able to comprehend the task and offered answers, although not all of these were correct. Analysis of the students work suggests these incorrect answers, are a result of a lack of geographical knowledge and not directly linked to EBL.

Differentiated worksheets were developed to help reduce lexical and reading speed barriers. These sheets ranged from multiple-choice answer sheets to differentiated writing frames, which incorporated images. The multiple-choice answer sheets proved effective and enabled all students to access tasks. The writing frames were also effective for the majority of students. The majority of students used these writing frames to offer reliable but often basic answers. Although, even with the support of the writing frame,

some students found tasks unmanageable within the allotted time. Therefore, the amount of required answers on these frames was reduced making them more manageable.

Throughout these investigation students' in years eight and nine did not find comprehension by task to be a barrier. Similarly, understanding of spoken language was recognised as an initial barrier but only presented itself as a challenge for the year seven students. This is to be expected as they are new to the country and are often unfamiliar with spoken English. This barrier was overcome by applying the same strategy as comprehension of task. These strategies proved effective, and the students were able to successfully attempt all tasks, although at a slower pace.

Post-its proved effective in overcoming the Chinese students' reluctance to ask questions. The post-its enabled students to offer valid questions. However, despite the strategies initial success, the Chinese students were still reluctant to ask questions for the duration of the lesson, whether this was engaging in the enquiry process or asking for help. This suggests that this barrier has not fully been overcome, and requires further investigation.

The barrier of lack of confidence was not fully overcome. However, it was partially reduced through the use of effective pairing with British students. The pairings encouraged the Chinese students to participate in the enquiry process. All students worked effectively in their pairs to discuss and complete tasks, although students had varying success in the completion of these tasks. These pairings proved particularly effective when the year seven students designed and presented their hurricane shelters to the class offering basic descriptions. Prior to the pairings, the Chinese students were reluctant to participate in this type of activity. Paired work was also useful in enabling the Chinese students to practice their spoken English and helped when they did not

understand a task. As recognised by Huang (2005), Chinese students are often reluctant to question the teacher. By working in pairs, the Chinese students were able to ask their partners when they did not understand a task or instruction. This helped to improve the understanding of spoken language.

Cheng (2004) recognised that the Chinese education system does not encourage creativity. This unfamiliarity with creativity can act as a barrier to accessing EBL. The year seven students demonstrated that working in pairs supported them in offering a basic level of creativity. This was demonstrated in the designing and presentation of their hurricane shelters. Offering students' a partially completed and a model answer further supported the task. The partially completed answer supported the students in comprehending and getting started on the task. Whilst the model answer enabled the students to see what was required of them when completing the task. It also reduced comprehension barriers. However, their answers were basic and heavily relied on the use of images to explain their answers.

5.3 Implementations for My Teaching Practice

This investigation has identified some barriers which Chinese students face when learning through EBL. By having an awareness of these barriers, I was able to develop strategies to help these students access EBL. I will continue to apply these differentiation strategies, monitor effectiveness and where necessary adapt them. I will also attempt to identify additional barriers, which the Chinese students face, and develop new strategies for supporting them.

To further support Chinese students in overcoming their reluctance to ask questions, they could be allowed to write any questions or contributions on an additional post-it. This could then be handed to the teacher. This keeps the students questions low key and

between the teacher and the student. As the Chinese students become more confident, this strategy can be withdrawn and they can be encouraged to ask questions verbally.

5.4 Implementations for My School and the Wider Community

This investigation has enabled me to develop a bank of resources specifically designed to support Chinese students. I have created a digital folder on the school's system entitled 'Support for Chinese Learners'. In this folder, I have placed all of the resources, which were developed throughout this investigation. Any additional resources, which are developed, will also be placed in the folder. This folder is accessible to all teachers but will mainly be of use to teachers within my geography department. By effectively applying these differentiation strategies and supporting the Chinese students, it may lead to an increased uptake at KS4.

I will present my findings at a staff Inset in October 2018. During this Inset I will explain the findings of my investigation to members of staff from all departments. Although not consistent, EBL is practiced in other subjects in the school, such as Science. Some of the differentiation strategies developed during this investigation can be applied to other subjects. For example, the concept of offering the Chinese students key words with images in advance. All staff members will be encouraged to develop subject specific strategies to support the Chinese students based on the findings of this investigation. I will encourage a whole school initiative where resources are developed and shared, ensuring that Chinese students are consistently supported throughout the school.

There are an increasing number of Chinese students in private schools in England. The ideas presented in this investigation could be shared with schools that also have a

community of Chinese students. This should support and improve the learning of Chinese students nationwide.

5.5 Opportunities for Further Development

Due to timetabling constraints, the EAL specialist was only able to observe me teaching the year eight class. It would have been more beneficial if she also observed me teaching a year seven and nine class. This would have offered insight into how the Chinese students' ability to manage EBL develops the more familiar they become with its learning style. In addition, new learning barriers might have been identified.

To support Helms (2015) claim that creativity can be learned, more creative methods of learning could be used. For example, role-play, where students work in their pairs to study and present information. The effectiveness of these methods could be monitored, and where necessary differentiated strategies developed to support the students.

It is important to support the Chinese students outside of the classroom. This can be achieved by offering written feedback. This was recognised by Theodoridis (2015) but not explored in depth in this investigation. Theodoridis (2015) claims that offering EAL students written feedback will assist them with their motivation and encourage them to reflect on and improve their work. Effective written feedback explains to students what went well, what they could do better and how they achieve. If feedback is written down, then students can take their time to read it and consider what it means. This feedback can be on a formal task or a constructive review on what they achieved in the lesson. To support this, students can be set personalised targets. The effectiveness of written feedback in removing the identified barriers can be explored.

Although many of the individual differentiation strategies offered evidence of reducing learning barriers, it is a combination of all of the strategies which are most effective in reducing learning barriers. Arguably, the differentiation strategies should be applied when a student is in year seven and their progress should be monitored until they are in at least year nine to determine how effective the strategies have been. During this time period, additional barriers might be identified. Furthermore, it should be recognised that although students may have similar barriers, they are individuals. These were generic solutions to individual problems, but in reality, no one size fits all. As Vita (2000) recognises it is important that a teacher gets to know a student if their needs are going to be met. It is unrealistic to expect all learning barriers to be removed within the space of a twelve-week research cycle. Further investigation should be conducted into the continual effectiveness of the differentiation strategies.

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task

Appendix 1: Justification for Interview Questions

Statement Read to Students before Interviews were Conducted

I am studying for a Masters qualification in Learning and Teaching at the University of Oxford. Part of my qualification involves conducting an investigation. My investigation explores '*to what extent are students from Mainland China able to access EBL in a geography classroom in England?*' One of my research methods involves interviewing students from Mainland China to determine what I can do to make learning geography easier for you. I was wondering if you are willing to be interviewed as part of my study?

Question 1: Do you find studying geography hard?

This initial question aimed to help the respondents feel at ease and encourage them to consider what EBL is like in geography

Question 2: What do you find most difficult about geography lessons?

This question was asked *to 'identify any barriers which students from mainland China face when accessing EBL in geography'*. It aimed to support the action research cycles and identify additional barriers to learning.

> Question 3: What do you think is the main reason why you find studying geography hard?

This question was asked to '*identify any barriers which students from Mainland China face when accessing EBL in geography*'. It encouraged students to consider what might be the cause of these learning barriers. Identifying these learning barriers enabled me '*to develop differentiation strategies which assist students from Mainland China in overcoming these barriers to learning*'.

> Question 4: Do you find the lesson learning style different to your other classes? If so, in what ways is it different?

This question aimed to determine if EBL in geography has any distinct learning barriers. The responses from this question allowed me '*to develop differentiation strategies which assist students from Mainland China in overcoming these barriers to learning*'.

> Question 5: What do you find most enjoyable about geography lessons?

This question aimed to identify what the respondents find most enjoyable about EBL in geography. The respondents' responses helped to develop more engaging lessons.

Question 6: What is it that makes this enjoyable?

This question aimed to identify in more detail what the respondents find enjoyable in geography. For example, whether they enjoy a particular task or activity. The respondents' responses helped to develop more engaging lessons.

Question 7: How can the teacher make geography easier for you?

This question was asked '*to develop differentiation strategies which assist students from Mainland China in overcoming these barriers to learning*'. It aimed to determine if the respondents were aware of any strategies, which could be used to support them.

Question 8: And finally, any other comments? What would you like to say? Anything?

This was an open question, which offered the respondents the opportunity to make additional contributions to the interview. It aimed to identify anything, which was not acknowledged during the interview process.

Appendix 2: Transcription of Student Interviews

Transcription of Initial Interview

Question 1: Do you find studying geography hard?

Student 8B: Errrr, I don't think it's that hard but, the lessons are good, we doing some fun stuff, yes, err I guess

Teacher: Ok, what about you?

Student 8D: Its ok

Student 8B: Yea

Teacher: Ok? Yea, ok, ok,

Student 9A: My opinion, is that I find that remember words, like places I find very hard in geography. That's the main thing.

Student 8A: Yea

Student 8A: No, I don't find studying geography hard

Question 2: What do you find most difficult about geography lessons?

Student 8B: Errr, sometimes there is some, really hard words but I don't know about it and, some different places.

Teacher: Ok that's good, and … what do find most hard?

Student 8D: Doing somes, talking about errr, some….talking about, I don't know this place. I'm sure I think, I sure I feel very hard

Teacher: Ok, Ok, mmm

Student 8A: I think the hardest thing about geography some questions about…

Student 9A: Geography lessons, err sometimes like the noise, it's a bit noise.

Question 3: What do you think is the main reason why you find studying geography hard?

Student 8B: Err, Err, cause there is some, places you don't know cause, you know you never seen it before because the world is big and when you studying that you have to practice some stuff and, then yea you can learn it easier but yea at the start of it lesson you may get struggle

Teacher: Good, and student 8D….

Student 8D: Errrr, this question for me?

Teacher: Yea, yea, yea

Student 8D: mmmm, because errr something, err I never go this place and I never I never know this place and then I learn and I then, find it hard

Teacher: Ok, Ok, good ok

Student 8A: Because usually I don't really understand how is something happening

Student 9A: I think it's my English. Some words I don't understand.

Question 4: Do you find the lesson learning style different to your other classes? If so, in what ways is it different?

Student 8B: errr,

Teacher: In is it a bit different, in what way?

Student 8B: Yea, it's different about the lesson but we watch some, err videos and we do some different stuff, and it's good, it's like learning about the world and learning about the mountains and stuff yea and that's good

Teacher: Ok and you say the same, is it different to other subjects?

Student 8D: mmm its different because maybe errr your always, open the window to make me easily to learn

Teacher: Ok good,

Student 8A: Every subject is different and in geography lessons we have fun and meanwhile we study quite a lot

Student 9A: Yea, quite different, I think. Like in geography, like we speak more, and other subjects like were writing more, writing more. Like in China, most teachers they just teach you this question and then they give you the question like this, a similar figure, like like many questions similar to this and then just do it for homework.

Question 5: What do you find most enjoyable about geography lessons?

Teacher: What is good about geography lessons?

Student 8B: Err err he can tell you

Student 8D: Err its different for other lesson

Student 8B: Ok, Ok, I found most enjoyable is, err we learn some fun stuff and we learn and different titles like why have sharks in my garden and stuff like we learn in different style and its, maybe different and funny yea yea

Teacher: Ok, good, good,

Student 8A: I think that the most enjoyable is learning about fantastic places that you never seen

Student 9A: I think it's like the talking bit, like the, when you like we can discuss the question, yea I find most enjoyable.

Question 6: What is it that makes this enjoyable?

Student 8B: err

Student 8D: errr, err maybe talk, errr is something and sometimes it err. You can, you can, you can talk err, about some some geography geography topics for talking with each other.

Student 8B: Err yea, enjoyable yea

Student 8A: This makes it enjoyable because you learn about it and you trying to get better to impress teacher and classmates

Student 9A: I find the talking bit enjoyable, like and it makes English better I think, yes.

Question 7: How can the teacher make geography easier for you?

Student 8B: Err

Student 8D: Make…are you say

Student 8B: Yea, you go

Student 8D: mmm, make some key word

Teacher: A few key words, good. Ok.

Student 8B: Work with friends

Teacher: Oh partners? Good. Yea

Student 8B: Yea yea yea, and yea that's good

Teacher: Do you think that you would work well with ****?

Student 8D: Yea, **** is a good

Teacher: Ok yea, and who would you work well with?

Student 8B: Yea yea yea

Teacher: Yea

Student 9A: More easier? Maybe more help sheet, Maybe more like err speaking, yea

Question 8: And finally, any other comments? What would you like to say? Anything?

Student 8B: err

Student 8D: mmm, maybe

Student 8B: I don't know, it's quite good, but I don't know the other stuff.

Student 8D: mmm maybe, ahhh I'm so tired, ok you can make more fun in the geography lesson

Teacher: Ok good, yea

Teacher: Ok, so that it then, yea, thank you

Student 8A: Yea, thank you

Student 9A: I think its ok

Transcription of Final Interview

Question 1: Do you find studying geography hard?

Student 8B: errr, I think it's good like I can found, I don't know it's easy, I'm good at it.

Teacher: Easier? Ok good

Student 8A: Errr, when I came to year seven it was my first-time learning geography, and actually I realise that its quite easy and really fun, so yea its good?

Teacher: Ok, good, and you?

Student 8D: Its ok,

Teacher: Ok

Student 9A: err I find it, hard in some questions, yea, yea, like, if I need to like the about the map things, I think. Yea the map, I need to correct them.

Question 2: What do you find most difficult about geography lessons?

Student 8B: err, I don't know, learning some different, words we don't know, we never heard about it, yea

Student 8A: Yea I guess that words are the most hardest thing, to, words like erosion, I didn't know what that means, like I don't know…..

Teacher: Ok yea strange terms

Teacher: Is that the same for you? What is hard in geography?

Student 8D: Yea, the word is hard, never teach before

Teacher: Ok

Student 9A: I also find that, the writing bit, is like, I know how, how the thing works, but I don't know how to, say it in like correct ways

Question 3: What do you think is the main reason why you find studying geography hard?

Student 8B: I think words and stuff that, we never heard about it

Student 8A: Not understanding how it's happening, not, not imagining. I can't imagine somethings so….

Teacher: Ahh, ok good, if you haven't actually seen it, it's hard,

Student 8A and Student 8B: Yea

Student 8B: Yea, well you know show us some stuff, and we can understand it easily, you show us images and stuff of the place, and we can understand, yea

Teacher: Good, is that the same for you?

Student 8D: Yea?

Teacher: Ok

Student 9A: I think it's the English, yea,

Question 4: Do you find the lesson learning style different to your other classes? If so, in what ways is it different?

Student 8B: Errr yea, every class is different and yea

Student 8A: yea, everything, between every teacher and….

Student 9A: Yea, because, in like other subjects, we do more about like test, errr like paper work, yea

Question 5: What do you find most enjoyable about geography lessons?

Student 8B: errr, I don't know it's good, and it's also it's fun in geography lessons, because we have like a laugh all the time yea

Teacher: Out of the work though, which tasks do you find most enjoyable?

Student 8A: I think the most is learning facts about different countries, because you get to know the countries more and we you go to the countries it's like, 'I know everything about them'

Teacher: Good, ok, and student 8D?

Student 8D: The same

Teacher: The same, yea, maybe we could do a lesson on Beijing or something?

Student 8B: yea

Teacher: Right so

Student 9A: When I can like, when you set the talking questions I can like talk, and when I need to like go around the room

Question 6: What is it that makes this enjoyable?

Student 8A: I think errm, the fun ahhh, is just like when we learn things, because it's always fun to learn something I guess because just get to know everything more and more, so, and we also play games.

Teacher: But what actually about the lesson, what part?

Student 8B: errr, I don't know, your asking about weird questions like why, err that boy don't have a house. These questions are the most fun part, because you want to learn more with those questions

Teacher: Ahh ok the questions, good, yep, and…

Student 8B: Yea

Student 8D: Same

Teacher: Same with videos? Is video good?

Student 8D: Yea

Teacher: Ok

Student 9A: I think it's the, when I'm doing the questions I'm trying to like figure out, what's right and what's wrong, I think,

Question 7: How can the teacher make geography easier for you?

Student 8B: I don't, maybe other people can help, like you know **** in helping Student 8D, sometimes…

Student 8A: I'm actually alright with….

Student 8B: Yea, I'm good as well, yea but **** is helping Student 8D, that goods

Student 8D: Yea, Yea

Teacher: Ok, so think about that ok, how many people would you put in a group ideally?

Student 8B: Two? like our tables two

Student 8D: Two

Student 8A: Three

Student 9A: errrm, maybe like more the paper, more help sheet, yea, I think their very useful

Question 8: And finally, any other comments? Anything else which you think you can add?

Student 8B: Yea, it's good, geography's fun, yayyy

Student 8D: Yea, geography is fine

Student 8A: It's think it's every, I think's it's everything, fine for me.

Teacher: Ok, just keep on with the key words, their useful? And that will help you? Ok good thank you.

Student 9A: No I think its ok

Appendix 3: Outline of Taught Enquiry Lessons

Year 7

Lesson 1 – What are the effects of Climate Change?

This lesson introduced the students to the concept of climate change. Students were required to use the information provided to determine what the effects of climate change are, whether the effects are good or bad, and how we can combat them.

The lesson starter task involved students being shown a picture of an effect of climate change and being asked to write down, what was the cause? Students were then shown a video relating to climate change and asked to write down 'what the impacts of climate change shown in the video are?' and 'what messages are being communicated in the video?'. Students were then asked to complete a card sorting task, where they were required to sort a series of statements relating to different methods of combating climate change, and categorise them by the most and least important methods. Students were then asked whether they think that climate change is good or bad, and to justify their answers. Finally, as a plenary, students were asked to write down ways in which we can reduce climate change.

Lesson 2 – How do we measure the weather?

This lesson introduced students to the different types of instruments which can be used to measure the weather, and challenged students to consider how effective they are.

The lesson starter task presented students with the open question of 'how do we measure the weather?' Students were required to write down different ways in which weather can be measured. The next task was interactive and required students to walk around the classroom and observe eight different pictures of instruments which measure different types of weather. They students were expected to write down what the instrument was called, and what type of weather it measures. The next task required students to critique the instruments and to write down and explain some advantages and disadvantages of a selection of the instruments. Finally, as a plenary, students were expected to recall from memory a weather instrument and explain what it measures.

Lesson 3 – What were the effects of Hurricane Katrina?

This lesson introduced students to the effects of Hurricane Katrina. The lesson starter task, presented students with a picture of New Orleans, after Hurricane Katrina and asked them to write down any questions which they may have about the picture. Students were given background information of the hurricane and shown a short video on the effects. Students were then required to complete a sorting task where they categorised the effects of the hurricane into social, economic and environmental. Students were then expected to select what they believed to be the three worst effects and write down an argument justifying their selection. Finally, as a plenary, students were asked to recall from memory, three effects of the hurricane.

Lesson 4 – What makes an effective Hurricane Shelter?

This lesson introduced students to what hurricane shelters are and what makes an effective hurricane shelter. Students were required to analyse all of the information which they had been given and design their own hurricane shelter. They were asked to present and explain their designs to the class.

The lesson starter task presented students with a picture of an obscure hurricane shelter and asked students to write down what questions they would like to ask about the image. Students were taught what a hurricane shelter is and shown a selection of different shelters, accompanied by a video. Students were expected to discuss what makes an effective hurricane shelter and write down the advantages and disadvantages of each. Students were then expected to use all of the information they had acquired to design their own shelter. They were asked to present their ideas to the class and to be open to questioning. Finally, as a plenary, students were required to write down from memory a definition of a hurricane shelter, and one advantage and disadvantage of them.

Year 8

Lesson 1 – Where is Old Harry's wife?

This lesson introduced students to coastal processes and landforms. It looked at how coastal landmarks such as stacks and stumps are formed.

The lesson starter task presented the students with the question 'where is Old Harry's wife?'. Students were required to write down at least three questions which they would like to ask relating to the original question. These questions were discussed as a class. The students were asked to use their atlases to identify and answer a series of question relating to where in the world the lesson was focused i.e. Dorset, UK. The students were then given information relating to the original question, before being asked to complete a pairing and sequencing task. This task required students to put a series of statements together which explained how headlands are formed into a logical order. They were then required to pair these statements with the appropriate images. Students were then given more information relating to the original question, before being asked to complete a diagram which explained how stacks and stumps are formed. Finally, students were required to write down an explanation for where Old Harry's wife is, using appropriate and sufficient geographical vocabulary. The plenary required students to verbally summarise what they had written for this final task.

Lesson 2 – Why are there bodies on the sea?

This lesson explored the marine ecosystems in Cancún, Mexico, in particular the coral reefs. Students were taught how the coral reefs are being destroyed and were required to consider, what can be done to protect them.

The lesson starter task presented students with the question 'why are there bodies on the sea?' The students were required to write down at least three possible reasons. The ideas were discussed as a class. The students were then informed that the lesson will focus on Cancún, Mexico. Students used an atlas to locate Cancún, and mark its position on a

map. They then participated in an interactive task, where they walked around the classroom and analysed a series of pictures. The pictures were of threats to the coral reef and the students were required to identify the threats accordingly and explain each one. Students were then shown a video which explains that the bodies under the sea are in fact statues which act as an artificial coral reef. To support this video, students were required to answer a set of questions. Students were then required to write a short letter to a marine authority explaining whether or not they believe that the artificial coral reefs are a good idea. As a plenary, students were asked to answer five written questions, which tested their knowledge of the lesson.

Lesson 3 – Why is St Martins Fantastic?

This lesson focuses on the Caribbean island of St Martins. It is a case study lesson, where students learnt what makes the island unique and why it fantastic.

The lesson starter task presented students with an image of St Martins and students were required to write down at least three questions which they would like to ask about the picture. These ideas were discussed as a class. The students then completed a basic reading task before being asked to complete an image sort task. The students were presented with a series of images which explained why people visit St Martins and hence why it is fantastic. The students were required to place these images under the headings of sailing, beaches, shopping and nightlife. The students were then required to produce an extended piece of writing, explaining what they believed were the main reasons why St Martin is fantastic. As a plenary, the students were required to recall from memory and communicate verbally, three reasons why St Martins is fantastic.

Lesson 4 – Why has Christiano left home?

This lesson explored what life is like for those living in favelas. Students learnt that some favelas were demolished in the built up to the Olympics. The students were encouraged to think of ways in which favelas could be improved rather than demolished.

The lesson starter task, presented students with a picture of a Brazilian boy standing next to some rubble. Students were presented with the question, 'Why has Christiano left home?' Students were asked to write down at least three possible reasons. These ideas were discussed as a class. The students were informed that Christiano lived in a favela in Rio de Janeiro. They were then required to complete an ordering task. Students were given a series of statements relating to the destruction of favelas and asked to put them into a logical order explaining why favelas were demolished. The students then shared their ideas with the class. Following this, the students were shown a short video on the demolition of favelas prior to the Olympics. Students were then expected to write down and explain any alternatives to demolishing favelas and consider how they can be improved. For a plenary, students were asked to write down a brief summary of why Christiano left home.

Year 9

Lesson 1 – What happened in Haiti?

This lesson explores the effects of the 2010 Haitian earthquake. The lesson required students to formulate a conclusion as to why did so many people died as a result of the earthquake?

The lesson starter task presented students with a picture of the Haitian flag and asked them to guess the country which they will be studying. Students were then shown where Haiti is located on a map. Following this, students were shown an obscured picture of an earthquake effect and asked 'what do you think could be happening in the picture?' Students were expected to write down three possible answers. As the students did this, the obscured parts of the picture were gradually revealed. Students were then informed of the causes of the earthquake and told some of the effects. Students were also shown a supporting video. They were then asked to complete a card sorting task. For this task, the students were required to arrange a selection of reasons which explained why the earthquake was so deadly into social, economic and environmental categories. Students were then required to make links between as many of these reasons as possible. The students were then expected to use this information to produce an extended piece of writing, explaining the main reasons why so many people died. The lesson plenary asked students to verbally summarise what they believed were the main reasons so many people died in the earthquake.

Lesson 2 – What is extreme tourism?

This lesson introduced students to extreme tourism and examined its positive and negative effects on the world.

The lesson starter task presented student with a picture of an extreme tourism task and student were asked 'what questions would you like to ask?'. Students were encouraged to write down at least five questions. These questions were shared and discussed as a class. Students were given a definition of extreme tourism. Students then participated in an interactive task where they were required to walk around the classroom and analyse eight different pictures. They were asked to identify the extreme tourist activities and where in the world they are occurring. Students were then shown a video of extreme tourist activities around the world, and expected to complete an extended written task. For this task, students were challenged to consider whether they think that extreme tourism has a positive or negative impact on the world. Students were required to justify their answers. For a plenary, students were asked to write down from memory three extreme tourism activities and define where in the world they can participate in them.

Lesson 3 – What is Ecotourism?

This lesson introduced ecotourism, and challenged students to consider if it truly does have a positive effect on the environment?

The students were initially presented with a picture of an ecotourism task and asked what questions they would like to ask about the picture. Students were encouraged to

write down at least five questions. These questions were shared as a class and discussed. Students were then given definitions for eco-tourism, stewardship and conservation and offered a brief introduction as to what eco-tourism involved. Students were shown a video which focused on ecotourism on the Galapagos Islands. They were then challenged to complete a card sorting task to identify and separate ecotourism activities from non-ecotourism activities. Students were then required to produce an extended piece of writing highlighting the positive and negative impacts of ecotourism and formulating a conclusion as to whether ecotourism can truly have a positive effect on the environment. For a plenary, students were asked to summarise their answer for this task, and share their thoughts with the class.

Lesson 4 – Can tourism ever be managed effectively?

This lesson challenged students to consider the positive and negative effects of mass tourism and formulate an opinion on whether mass tourism can ever be managed effectively.

Students were shown a picture of the negative effects of mass tourism and asked to write down what questions they would like to ask about it. They were required to write down five questions. Students were given a definition for mass tourism and asked to write it down. I then explained the positive and negative effects of mass tourism to the students. The students were then challenged to consider whether mass tourism can be managed effectively. Students were given the scenario of being in charge of a tourist resort and were required to manage the negative impacts of mass tourism effectively. They were required to develop effective management strategies. Students were asked to

present their ideas to the class and to be prepared to discuss their ideas. The students were then asked to take these management strategies and produce an extended piece of writing, justifying and explaining their answers. Finally, for a plenary, students were required to recall from memory and write down three of their most effective management strategies.

Appendix 4: Lesson Observation Form

Name:		Date:	
Observer:		Period	
Year Group	8	Topic:	
Focus of observation:			

Legends: 1-No Evidence   2-Basic Evidence   3-Good Evidence   4-Outstanding Evidence

	1	2	3	4
1. The accessibility of the lesson				
a. Do the Chinese students understand the lessons learning objectives?				
b. Do the Chinese students understand the tasks which they have been set?				
c. Are the Chinese students able to access the lesson sufficiently?				
d. Do the Chinese students play an active role in learning in the lesson?				
2. The lessons tasks				
a) Does the teacher clearly demonstrate what the tasks involve?				
b) Do the Chinese students understand what they are doing and why they are doing it?				
c) Are the Chinese students able to access the tasks sufficiently?				
d) Are the Chinese students suitably challenged by the tasks?				
e) Are the Chinese students confident in working independently?				

3. **Support Resources for Chinese students**	1	2	3	4
a. Is the teacher aware of the different learning needs of the Chinese students?				
b. Are the supporting resources suitable for the needs of the Chinese students?				
c. Do the supporting resources help the learning needs of the Chinese students and enable them to access the lesson?				
d. Do the supporting resources enable the Chinese students to achieve the lessons learning objectives?				
e. In what ways could the supporting resources be improved to help the learning of the Chinese students?				

4. **Verbal Communication**	1	2	3	4
a. Does the teacher explain all tasks clearly?				
b. Does the teacher take into consideration the different learning needs of the Chinese students when giving instructions?				
c. Does the teacher moderate their language effectively to support the learning of Chinese students?				
d. Do the Chinese students understand the instructions which the teacher is giving?				

e. In what other ways could the teacher effectively moderate their language to support the Chinese students learning?

5. Chinese student's participation in class and group activities	1	2	3	4
a. Do the Chinese students effectively participate in class discussions?				
b. Do the Chinese students effectively participate in class activities?				
c. Do the Chinese students contribute effectively to paired or group work?				
d. Do the Chinese students seem confident when partaking in these activities?				
e. What can be done to make these activities more accessible to Chinese students?				

6. Barriers to learning

a. What are the main barriers that the Chinese students face when accessing learning through enquiry?

b. Why do you think that these barriers to learning exist?

c. What can be done to overcome these barriers?

7.	**Suggested Improvements**

a.   What can the teacher do to further support the learning needs of the Chinese students?

b.   How can the teacher mediate their language further to support the learning needs of the Chinese students?

c.   Further comments

Appendix 5: Student 7B's unsuccessful 'methods of combating climate change' sorting activity
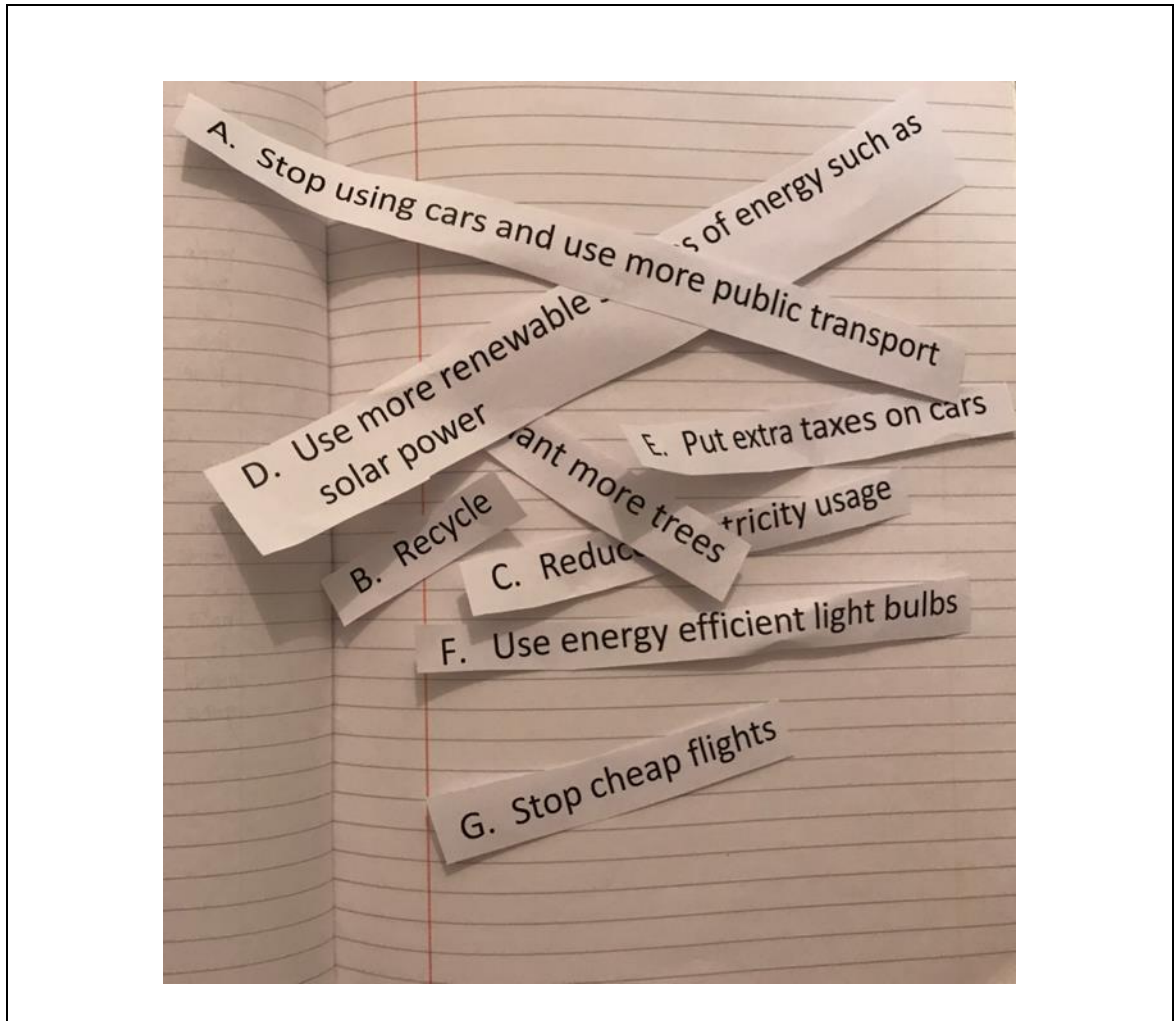
Appendix 6 – Student 8A's work for the atlas investigation task

Where is Old Harry's Wife?

Task: Use your mapping skills to answer the following questions?

1. Give a grid references for Swanage and Studland

2. Which county do Old Harry and his wife live in?

   Dorset

3. What is the elevation of this coastline in metres?

4. What is the closest city to Studland?

5. Can you spot any historic landmark nearby?

6. What is the distance in kilometres between Studland and Swanage?

7. How far is Studland in Kilometres from Witney?

   please complete

Task: Use your mapping skills to answer the following questions?

1. Give a grid references for Swanage and Studland

   Swange D1 ✓
   Studland D1

2. Which county do Old Harry and his wife live in?

   Dorset ✓

3. What is the elevation of this coastline in metres?

4. What is the closest city to Studland?

   ~~Corfe Sadl~~ Bounemouth

5. Can you spot any historic landmark nearby?

   Corfe costle ✓

6. What is the distance in kilometres between Studland and Swanage?

   10 km

7. How far is Studland in Kilometres from Witney?

   120 Km

Appendix 8 – Student 8C's work for a sequencing task
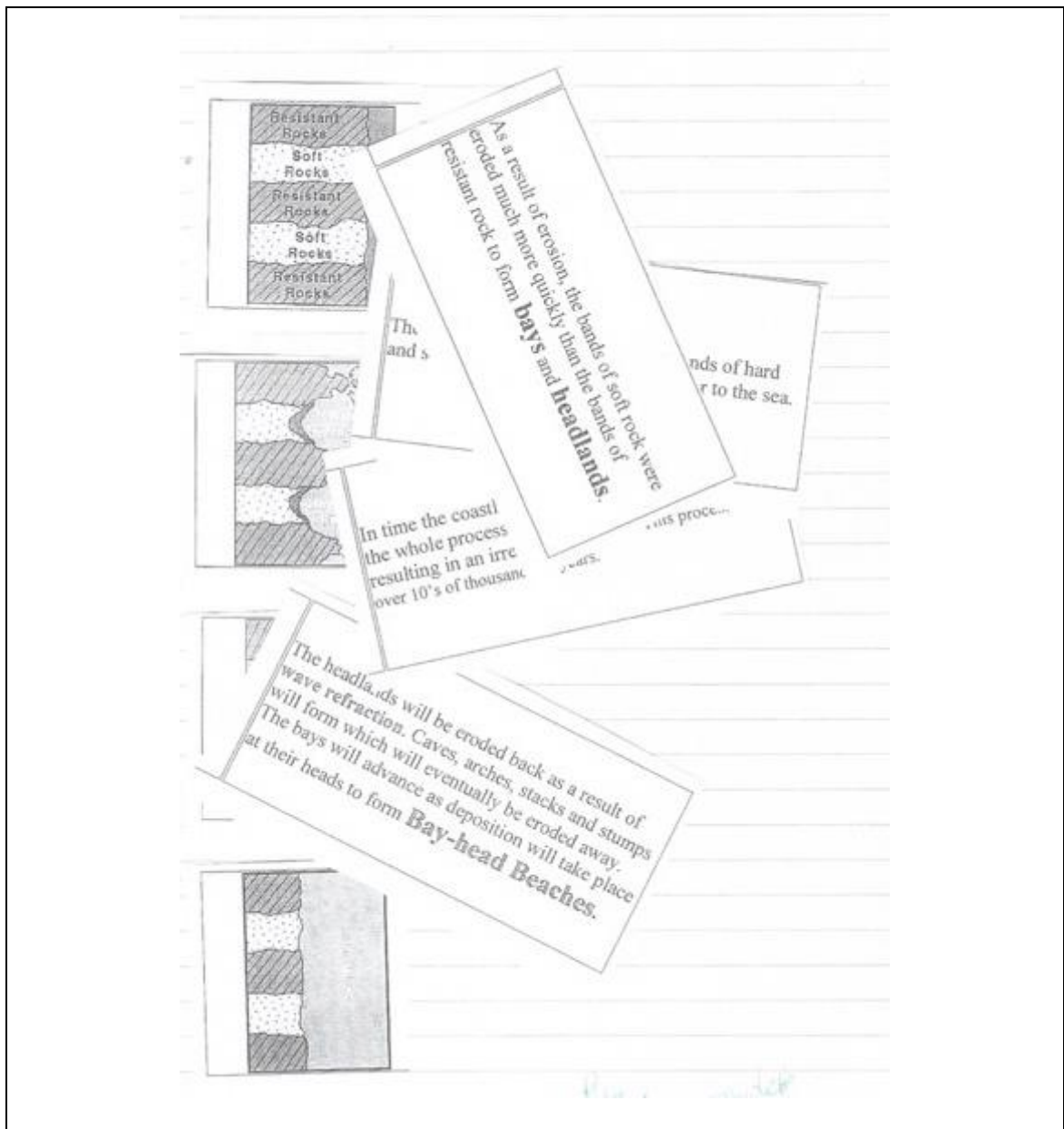
Appendix 9: Students 8D's work for the atlas investigation task

Where is Old Harry's Wife?

Task: Use your mapping skills to answer the following questions?

1. Give a grid references for Swanage and Studland

2. Which county do Old Harry and his wife live in?

3. What is the elevation of this coastline in metres?

4. What is the closest city to Studland?

5. Can you spot any historic landmark nearby?

6. What is the distance in kilometres between Studland and Swanage?

7. How far is Studland in Kilometres from Witney?

Appendix 10: Example of a completed observation form

Focus of observation:	• To determine if EAL students can effectively access enquiry based learning? • To determine what challenges EAL students face when learning through enquiry. • To determine if the teacher effectively supports the learning of EAL students when learning through enquiry. • To determine how enquiry based learning can be made more accessible to EAL students.

Legends: 1-No Evidence 2-Basic Evidence 3-Good Evidence 4-Outstanding Evidence

1. The accessibility of the lesson	1	2	3	4
a. Do the EAL students understand the lessons learning objectives?				✓
b. Do the EAL students understand the tasks which they have been set?				✓
c. Are the EAL students able to access the lesson sufficiently?				✓
d. Do the EAL students play an active role in learning in the lesson?				✓

2. The lessons tasks	1	2	3	4
a) Does the teacher clearly demonstrate what the tasks involve?				✓
b) Do the EAL students understand what they are doing and why they are doing it?				✓
c) Are the EAL students able to access the tasks sufficiently?				✓
d) Are the EAL students suitably challenged by the tasks?				✓
e) Are the EAL students confident in working independently?				✓ *

They worked with a buddy and this was helpful to them.

1

3. Support Resources for EAL students	1	2	3	4
a. Is the teacher aware of the different learning needs of the EAL students?				✓
b. Are the supporting resources suitable for the needs of the EAL students?				✓
c. Do the supporting resources help the learning needs of the EAL students and enable them to access the lesson?				✓
d. Do the supporting resources enable the EAL students to achieve the lessons learning objectives?				✓
e. In what ways could the supporting resources be improved to help the learning of the EAL students?				

Excellent visual aids; great use of modelling. Showing sub-titles with the video would give EAL students extra support. However, the students in the classroom were clearly capable of understanding the teacher's instructions which demonstrate good listening skills so this support might be more applicable to EAL students who have arrived in the UK more recently.

4. Verbal Communication	1	2	3	4
a. Does the teacher explain all tasks clearly?				✓
b. Does the teacher take into consideration the different learning needs of the EAL students when giving instructions?				✓
c. Does the teacher moderate their language effectively to support the learning of EAL students?				✓
d. Do the EAL students understand the instructions which the teacher is giving?				✓
e. In what other ways could the teacher effectively moderate their language to support the EAL students learning?				

The teacher was already using good strategies such as defining words, giving simpler synonyms (e.g. threat=danger) and lots of repetition along with asking English-speaking pupils (as well as EAL pupils) to explain what he had said.

3. Support Resources for EAL students	1	2	3	4
a. Is the teacher aware of the different learning needs of the EAL students?				✓
b. Are the supporting resources suitable for the needs of the EAL students?				✓
c. Do the supporting resources help the learning needs of the EAL students and enable them to access the lesson?				✓
d. Do the supporting resources enable the EAL students to achieve the lessons learning objectives?				✓
e. In what ways could the supporting resources be improved to help the learning of the EAL students?				

Excellent visual aids; great use of modelling.
Showing sub-titles with the video would
give EAL students extra support. However,
the students in the classroom were
clearly capable of understanding the
teacher's instructions which demonstrate
good listening skills so this support
might be more applicable to EAL students
who have arrived in the UK more recently.

4. Verbal Communication	1	2	3	4
a. Does the teacher explain all tasks clearly?				✓
b. Does the teacher take into consideration the different learning needs of the EAL students when giving instructions?				✓
c. Does the teacher moderate their language effectively to support the learning of EAL students?				✓
d. Do the EAL students understand the instructions which the teacher is giving?				✓
e. In what other ways could the teacher effectively moderate their language to support the EAL students learning?				

The teacher was already using good strategies such as
defining words, giving simpler synonyms (e.g. threat=danger)
and lots of repetition along with asking English-speaking
pupils (as well as EAL pupils) to explain what he had said.

7. Suggested Improvements

a. What can the teacher do to further support the learning needs of the EAL students?

— Sub-titles on video would be useful
for EAL students generally.
However, the teacher was clearly doing his
utmost to help them.

b. How can the teacher mediate their language further to support the learning needs of the EAL students?

—This was done really effectively with
clear instruction, simple explanation
and repetition. I couldn't improve on it

c. Further comments

Outstanding lesson — EAL students were
very pleased to have been helped and
had their needs recognised. The
differentiation was clear but the
students who sought challenge were
given it. It was also a very engaging
lesson. The pace was fast enough to
keep it interesting and the EAL aids
meant that they could keep up
with it too. It would be wonderful
if more teachers helped their EAL
students in this way! (I enjoyed the
lesson too)

(I spoke to one of the EAL students after class. He was with
another EAL student and was saying how great it was that they
had special sheets and key words. He was very positive about the teacher.)

Appendix 11: Student 9A's work for a categorising task

Main: **Investigation**: Why did so many people die in the Haiti earthquake? *People*

Broken main gas pipes were often set alight by sparks from cables	On the 12th January 2010 an earthquake hit Haiti at 4.43 pm	The older ornate stone buildings collapsed trapping people	The earthquake only lasted 40 seconds but destroyed many office blocks	Emergency services were hindered by fallen buildings blocking roads
Many people were at work and were crushed under collapsing office blocks	Whole areas of poorly built slum housing was shaken flat and destroyed by fire	The Haitian government is poor and cannot afford to pay for emergency services	The power of the earthquake damaged many of the new office blocks and blocks of flats	Violent aftershocks brought down loose masonry injuring many more people
Some people died in the street from their injuries as doctors could not get to them in time	The earthquake had cut off the water supply so firemen could not put out the many small fires	Many people in Port au Prince lived in poor quality housing that collapsed killing many 1 000s	Haiti is located between three tectonic plates	30,000 people were seriously injured with many more 10,000s of minor injuries.
Over 200,000 people were killed during and after the earthquake had stopped	The hospital was severely damaged and was not able to be used	Some people were crushed to death as taller buildings fell onto their homes	The country did not have the money to store emergency supplies ready for a disaster	The earthquake was only 7 miles down from the surface so it was very powerful

Appendix 12 – Student 7B's unsuccessful weather instrument identification task

	What is the instrument called? (Circle the correct answer)	What does it measure? (Circle the correct answer)
Picture 1	Barometer Sun Dial Stop Watch Weather Vane ✗	Speed Sunlight Height Air Pressure ✗
Picture 2	Barometer Weather Vane Stop Watch Sun Dial ✓	Sunlight Speed Wind Direction Air Pressure ✓
Picture 3	Barometer Sun Dial Rain Gauge Weather Vane ✓	Speed Rainfall Wind Direction Air Pressure
Picture 4	Okta Meter Sun Dial Rain Gauge Barometer ✗	Sun Light Cloud Cover Wind Direction Air Pressure ✗

Picture 5	Barometer Thermometer ✓ Rain Gauge Okta Meter	Sun Light Cloud Cover Temperature Air Pressure ✓
Picture 6	Sun Dial Barometer Rain Gauge Anemometer ✗	Sun Light Cloud Cover Wind Speed Air Pressure
Picture 7	Barometer Sun Dial Hygrometer Okta Meter ✗	Humidity Cloud Cover Wind Direction Air Pressure
Picture 8	Barometer Sun Dial ✗ Rain Gauge Campbell-Stokes Sunshine Recorder	Sun Light Cloud Cover Hours of Sunshine Air Pressure

Appendix 13 – Student 7A's incomplete work for the advantages and disadvantages of weather instruments task

Weather Instruments

Instrument 1 – Rain gauge
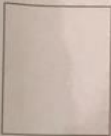
Advantages

- Cheap way to measure rainfall
- Easy way of measure rainfall
- Easy to set up

Disadvantages

- Can easily get knocked over
- Can easily be tampered with
- It can sometimes be hard to an accurate reading

Instrument 2 -

Advantages

-
-
-

Disadvantages

-
-
-

Appendix 14 – A comparison of student 8B and 8D's work for the coral reef threat identification task

Student 8B's work

Picture Number	Name of threat (Circle the correct answer)		Explain why it is a threat
1	Swimmers / Big Waves	(Overfishing) / Poisoned Waters	
2	(Ships anchors) / Slippery Surfaces	Big Waves / Big Fish	
3	Yellow Fish / Humans Speaking	Monkeys / (Humans Diving Equipment)	
4	(Pollution) / Sea Weed	Boats Crashing / Sharks	
5	Polar Bears / (Global Warming)	The Sea / Arctic Foxes	

Student 8D's work

Picture Number	Name of threat (Circle the correct answer)		Explain why it is a threat
1	Swimmers / Big Waves	(Overfishing) / Poisoned Waters	Not enough fish to support reef
2	(Ships anchors) / Slippery Surfaces	Big Waves / Big Fish	Rusted metal
3	Yellow Fish / Humans Speaking	Monkeys / (Humans Diving Equipment)	
4	(Pollution) / Sea Weed	Boats Crashing / Sharks	Poisining the fishes
5	Polar Bears / (Global Warming)	The Sea / Arctic Foxes	melted the ice and kill lots of animals

Appendix 15: Student 8B's work for the 'why are there sharks in my garden?' video task

Appendix 16: Student 8C's work for the 'why are there bodies under the sea?' written task

Why are there bodies under the sea?

1. What are some of the concerns for the reef?

2. How can this project benefit the environment?

3. What is the aim of the project?

   to get the correl growing and to help the fish have a habbitat.

4. What is the plan for the future?

Appendix 17 – Student 9B's work for the 'what is extreme tourism?'

picture analysis task

	What is the activity? (Circle the correct answer)	**Which country could this be?** (Circle the correct answer)
Picture 1	A Jungle Expedition / Swimming in Amazon A Boat Race / Bird Watching	Panama / Brazil UK / Thailand
Picture 2	Sky Diving / Free Running Free Falling / Bungee Jumping	Australia / Argentina Mexico / New Zealand
Picture 3	Sky Diving / Bungee Jumping Free Running / Free Falling	United Arab Emirates / Oman Saudi Arabia / Qatar
Picture 4	Sledging / Snow Walking Mountain climbing / Glacier Climbing	Greenland / Iceland Scotland / New Zealand
Picture 5	Swimming with Dolphins / Shark Watching Swimming with Sharks / Cage Diving with Sharks	Namibia / South Africa Singapore / Mexico
Picture 6	Paragliding / Bat Catching Rock Climbing / Caving	China / U.S.A. South Korea / Chile
Picture 7	Free Falling / Paragliding Climbing / Zip lining	Haiti / Hawaii Norway / Finland
Picture 8	Free Running / Free Falling Zip lining / Bridge Climbing	Australia / Austria Japan / Canada

Appendix 18 – Student 9A's work for the 'what is extreme tourism?'

written task

Is extreme tourism good or bad?

I believe that extreme tourism is a good/bad idea.

I believe this because............I quite love extreme tourism and I think if be more cayful it will not be dangevous.

1. I also like travel around the world and I likes to see new things. ✓

2.

3.

In conclusion...............

Appendix 19: Key word sheets, which incorporate images

Appendix 20 – Student 7D's unsuccessful 'effects of Hurricane Katrina' sorting activity
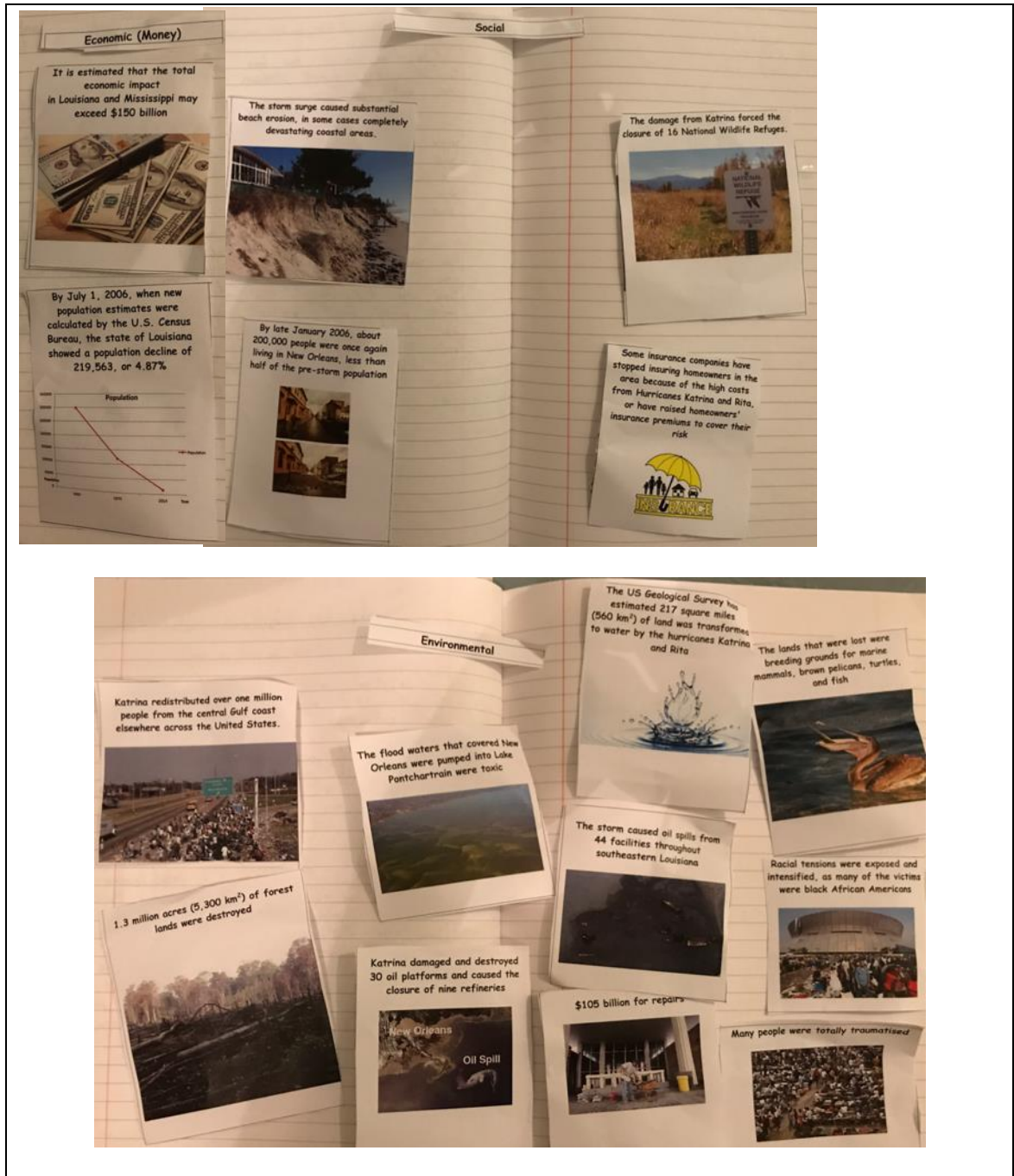
Appendix 21 – Year eight anonymous post-it task results
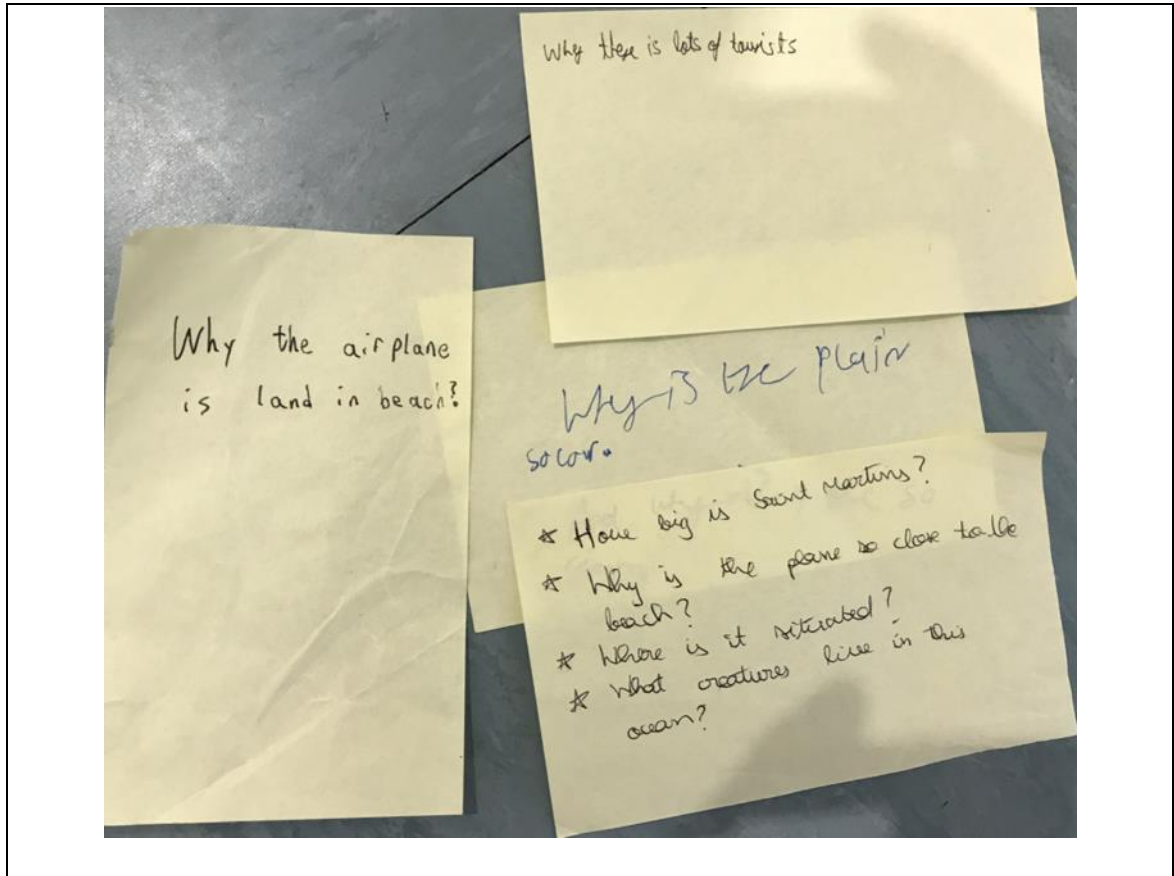
Appendix 22 – Student 8B and 8C's successful card sorting activity

Student 8B
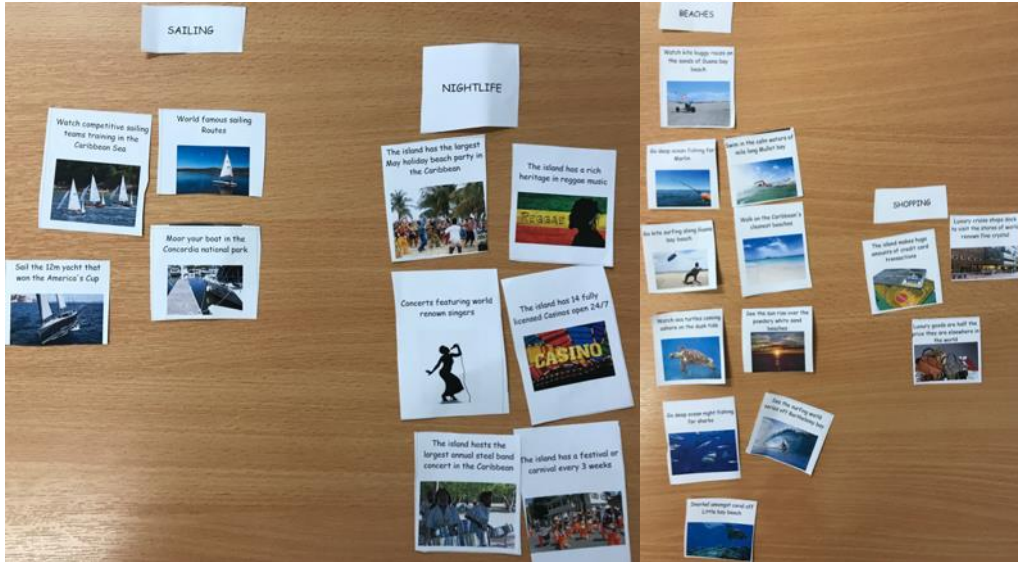
Student 8C

Appendix 23 – Student 8B and 8C's work for the 'why is St Martin fantastic?' written task
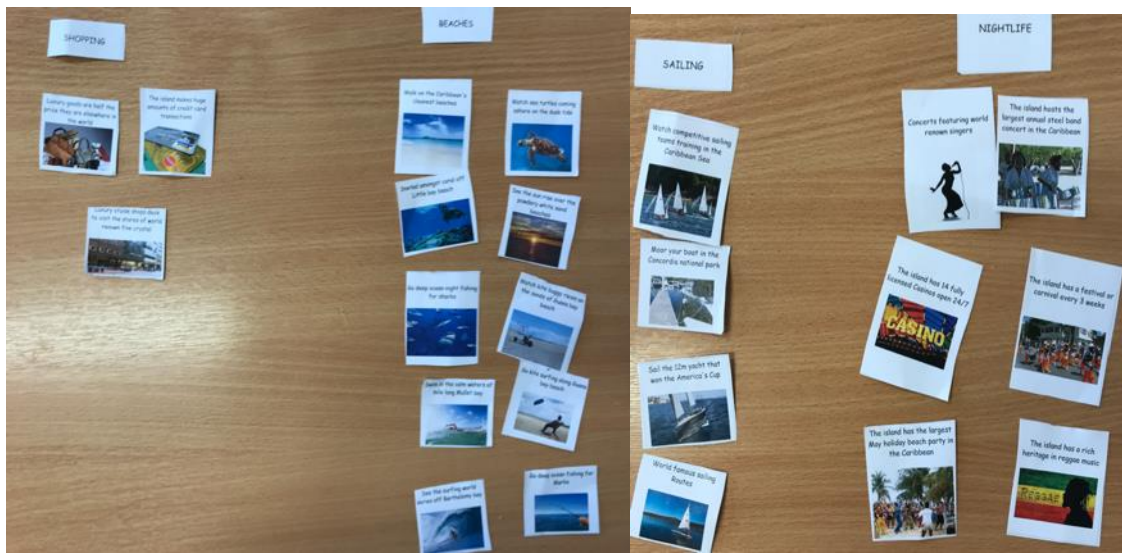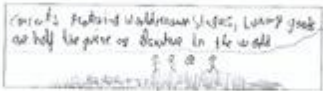
Appendix 24 – Student 8D's work for the 'why is St Martin fantastic?'

written task

Why is St Martins Fantastic?

1. I believe that the top reason why people visit St Martin is....

Because There is beautiful Area.

I believe this because:

- Because I went there before

- _____

2. I believe that the second reason why people visit St Martin is....

I believe this because:

- Some people say there is good

3. I believe that the third reason why people visit St Martin is....

I believe this because:

- I went to Search Internet
- For for this place. There is hat have shopping and have good sea.

Appendix 25 – Student 9C and 9E's unsuccessful image sorting task

Student 9C's work

Student 9E's work

Appendix 26 – Student 9A's work for the 'what is ecotourism?' written task

Is Ecotourism a good or bad idea?

I believe that ecotourism is good/bad idea

I believe this because

1. You can see things that you will never see in the city.

2. You can get more choice then inside the city

3. ....

Appendix 27: Model answers for the hurricane shelter design task

Floating Shelter

The' Storm Safe' is a floating, hexagon-shaped hurricane shelter made from heavy aluminum plate that's designed to protect you in the event of a large storm.

Storm Safe weighs around 800 pounds, is made of thick 3/16 inch aluminum plate and bolted together every six inches along the edges. The hexagon shape is very strong, crush resistant and even exceeds the Miami Dade small and large missile tests. The shelter comes flat, allowing you to store it and self-assemble, if and when it's needed. Costs $3600

Advantages
· Can float in case of flooding
·Can be self assembled
· Cheaper than other shelters

Disadvantages
You have to purchase your own extra supplies of air to go inside
Not very good for people hate enclosed spaces with no windows!

Dome Shelter

The InterShelter is a revolutionary portable dome shelter made of high-tech aerospace composite material that bridges the gap from tents and trailers to traditionally-built framed houses.

It can be assembled in 2-3 hours by only a few people Can withstand winds of up to 150mph and category 5 hurricanes

Advantages
· You can add extras like toilets, showers, kitchens and sleeping areas
·You can move it around from home to home if you move house
·If can be taken down outside of the hurricane season

Disadvantages
It looks a bit strange in gardens!
Costs $10,000

Safe Rooms

A safe room is a hardened structure specifically designed to meet FEMA criteria and provide "near-absolute protection" in extreme weather events, including tornadoes and hurricanes

A small community safe room is a safe room intended to hold 16 or fewer occupants. Larger safe rooms may hold small communities!

Advantages
· People who have a safe room installed may get discount on their tax bill
·It promises near absolute protection from hurricanes
·Can look very natural in a large garden
·Can added inside or outside the home

Disadvantages
They have no windows, difficult to know if the storm has definitely passed

Cost: $4000 for a small safe room
Up to £20,000 for a large safe room

Steel Shelter

A steel shelter can fit up to 5 people inside and has been tried and tested by winds up to 200mph. It also has rooms for pets!

Steel is strong material and is waterproof
It can also be used as a storage shed during non-hurricane season

Advantages
· Doesn't take up much room in the garden
·It is resistant from falling objects that would normally crush other hurricane shelters
·It is low-lying so it doesn't tip up in high winds
·Can be delivered to your door

Disadvantages
·Quite cramped inside and difficult to move, could be stressful in a hurricane situation
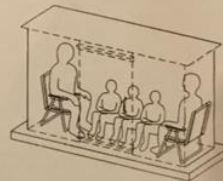
Cost: Only $1000-2000 so affordable for families on a budget

Appendix 28 - Partially completed answer for the hurricane shelter design task

Name of hurricane shelter

Draw a picture

Describe the shelter

What shape is it?

What colour is it?

How wide is it?

How tall is it?

What is it make of?

Aluminium   Wood   Iron   Plastic

Other?

Advantages

Does it cost a lot?

Can it be transported easily?

Does is look natural?

Cost

Disadvantages

Are there windows?

Are there toilets?

Is there enough space inside?

Appendix 29 – Student 8C's image analysis work

Appendix 30 – Student 8B's work for the 'how can we help improve favelas for local people?' task
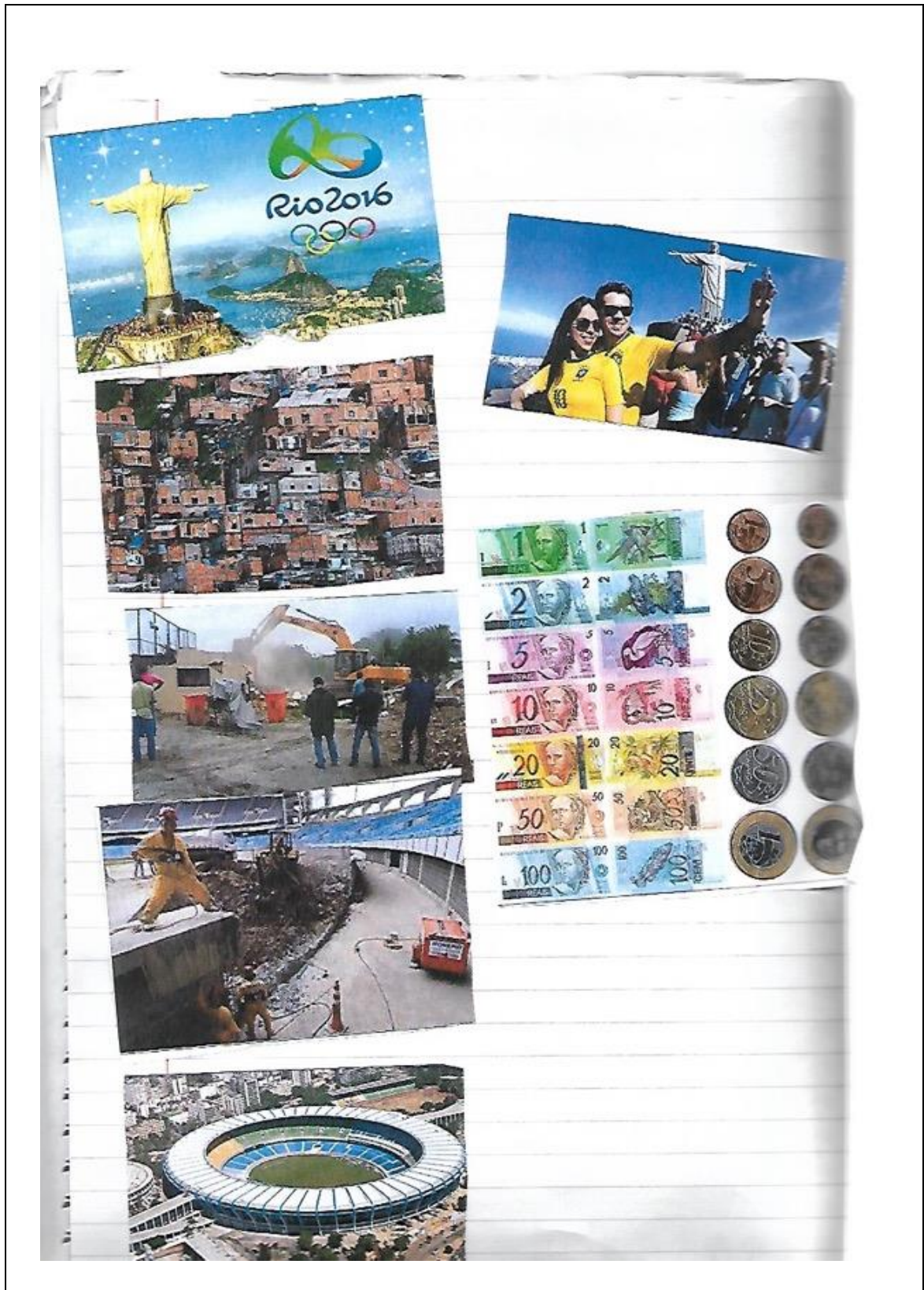
Appendix 31 – Student 8D's work for the 'how can we help improve favelas for local people?' task

How can we help improve favelas for local people?

1. proper – roads

2. Clearn water

3. Sewer

4. land slidepro protection

5. _____

6. _____

7. education

Can you think of any ways in which we can improve favelas?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Appendix 32 – Student 9A's work for the 'effects of mass tourism' task

Appendix 33: Student 9A's work for the 'how can tourism be managed effectively?' task

How can tourism be managed effectively?

Tourism can be managed effectively by

1. Spread the people out and make the place bigger.

2.

3.