An Investigation of The Introduction of A Virtual Learning Environment in Five Female Private and International Secondary Schools in Saudi Arabia: A Mixed Method Study

by

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Declaration

This thesis is submitted to the University of Warwick in support of my application for the degree of Doctor of Philosophy. It has been composed by myself and has not been submitted in any previous application for any degree. The work presented (including data generated and data analysis) was carried out by the author.

Abstract

This study investigates the use of Classera, a virtual learning environment, in five Saudi secondary schools. It explores to what extent teachers used Classera and what opportunities and constraints they found when using it. The study was carried out in private girls schools, three of which were international schools, in three different regions of Saudi Arabia. The overarching aim of this study was to investigate whether Classera has a future in secondary schools in Saudi Arabia.

A mixed methods approach was used in this study involving questionnaires, interviews and observation of lesson. The data collection had four different phases. The first comprised an interview with the Classera director. The second phase covered the distribution of the teacher questionnaire survey in the five schools (n=91). The third phase involved interviewing teachers in these schools (n=14) and their headteachers (n=5). The fourth phase covered observation of classes in four schools (n=9).

The study found that Classera was being used but its use was differentiated and some functions were more used than others. It was also found that there were some encouragers and difficulties for using Classera and these could be identified at the teacher level, at the school level, beyond the school level and at the level of CPD.

In regard to the encouragers, it was found that key issues at the teacher level covered willingness to learn, teachers' ICT skills and teachers' beliefs. At the school level, it was found that availability of ICT tools, the way that ICT use was led and enthusiasm of the school members were all factors in encouraging the use of Classera. Beyond the school level, it was found that supervisors encouraged teachers to use ICT and evaluated teachers' use of ICT. It was also found that parents were positive about Classera and allowed their children to use it. In regard to CPD, teachers received workshops in how to use Classera and reported that they were sufficient, included a hands-on element, addressed their needs and focused on developing teaching and their IT skills.

In regard to the difficulties, it was found that a few teachers in each school did not consider themselves very confident with ICT and were less sure about the value of Classera. It was also found teachers were unwilling to use Classera in a way that led to changes in pedagogic approach. At the school level, teachers found some students reluctant to use Classera and some found problems with internet access affected their use. A few teachers reported that leadership was unsupportive of the challenges involved and left them feeling pressurized. Beyond the school level, the teachers felt under pressure to complete the assigned curriculum following an unrealistic timetable, they were not always satisfied with the role of the supervisors and found that the Ministry of Education was not engaged in the use of Classera. Although, the majority of the teachers were happy about the CPD they received, some teachers found the training for Classera was not sufficient.

This study contributes to an under-researched area of ICT take-up through the investigation of the use of VLEs in the Arab world, in this case Saudi Arabia. The research findings contribute to our understanding of ICT take-up by showing the importance of enthusiastic leadership, proactive teachers and effective CPD. It further contributes by offering a model to explain ICT take-up and the consequences which flow from the conditions under which ICT is introduced.

Abbreviations

Becta	British Educational Communications and Technology Agency
CPD	Continuous Professional Development
ICT	Information Communication Technology
LMS	Learning management system
LP	Learning platform
MoE	Ministry of Education
MOOCS	Massive open online courses
PCK	Pedagogical Content knowledge
RQ	Research question
SA	Saudi Arabia
TAM	Technology Acceptance Model
TPACK	Technological pedagogical content knowledge
VLEs	Virtual learning environment system

Chapter 1 Introduction

This thesis investigates the use of a virtual learning environment (VLE) in Saudi secondary schools. It looks at to what extent teachers use a particular program and what opportunities and constraints they found. Policy makers around the world have been seeking to shift their educational systems in order to align better with the demands of their 21st century societies. ICT integration is seen as playing an important role in reforming and changing educational systems. ICT is seen as changing the nature of the traditional classrooms and breaking down barriers between teachers and learners. It gives learners and the teachers the opportunity to communicate, organize virtual classes and allows the teachers to upload teaching materials and share it with their students. New technology also changes the process of assessment so that learners can receive automatic feedback as well as peer comment. However, many countries have not found the expected changes when implementing ICT. This might be because the use of the ICT seems to require changes at the organizational, pedagogical and infrastructure levels. Garba et al.(2015) suggested certain factors are important and need to be in place in order to build the much desired 21st century learning environment. These factors include providing the schools with the basic ICT infrastructure and supporting teachers to use such facilities in teaching and learning.

This thesis contributes to an improved understanding of the integration of ICT and the barriers and opportunities ICT provides. It does this by investigating the use of the e-learning system called Classera in five different secondary girls schools in Saudi Arabia (SA). It offers insights into to the extent teachers do use Classera, what encourages them

and what constrains them in their use of Classera. A key concern in this study is to investigate whether Classera has a future in secondary schools in SA.

This is a new study in an under-researched area. Although, there have been recent studies that have investigated the use of educational portals in Saudi Arabia, most were conducted at the university level. For instance, Aljuhney (2017) carried out a comparative study of a Saudi university (Najran) and at the University of Limerick Ireland, in order to investigate how much impact VLEs such as Blackboard and Sulis had on the pedagogical performance of the staff members. Alenazi (2015) investigated academic staff perceptions in five Saudi universities about actual support and desired institutional support which would encourage them to adopt VLES. However, very few studies have been conducted in the schools' context. For example, Binothman (2015) assessed general acceptance of teachers and learners towards the use of a VLE (Tatweer) and evaluated its potential usefulness. However, this study was carried out while Tatweer was in a trial stage before it was discontinued. In other words, (to the best of my knowledge) no study has been carried out in Saudi schools to investigate educational portals in learning and teaching. This is probably because Saudi schools have only just begun to integrate VLEs into teaching and learning. Additionally, no study has investigated the Classera VLEs in schools.

This study is important for addressing a gap in the literature. This study has also personal significance. My family and especially my mother have been long interested in education and how to improve the quality of the education process. My mother was a mathematics teacher in a public school but she felt specific requirements of the Ministry of Education restricted her in developing her teaching. This led to her establishing a private school. Although, she faced lots of difficulties while building the school, she did not give up. I studied from kindergarten to secondary level in my family school. I always asked to stay

after the school day to help. This led me to share the goal of developing a more interactive and fun educational experience. Although, I was busy in studying at university, I visited the school from time to time and do some work there. My family supported my study after having my bachelor's degree and they went with me to Scotland to do my master degree. I applied for scholarship at that time and I was fortunate to get one. I met my husband, got married and moved to Sheffield. I was fortunate that my husband wanted to continue his studies. We studied our Master and PhD degree together and had our sons in the UK.

After completing modules in education at Sheffield University, I became interested in learner autonomy and how it impacted on both learners and learning. This led to my chosen dissertation topic: "Teachers Practices Toward Promoting Learner Autonomy at Secondary schools in the Kingdom of Saudi Arabia". My objective was to investigate what teachers in Saudi Arabia perceived as appropriate methods of teaching the English language and to what extent they promoted learner autonomy in their classrooms. The results showed that teachers had a positive attitude towards encouraging their learners to be autonomous. In addition, their responses to the survey showed that they were interested in employing technological media in their classrooms. On the other hand, although teachers were taking some initiatives in favour of learner autonomy such as encouraging the learners to search for the knowledge by themselves through using available resources, they still remain trapped in some other traditional habits in their teaching. For example, they did not give many opportunities for learners to self-evaluate their work. During this time, the Ministry of Education had become more interested in integrating ICT in the schools to reform the educational process. They wanted to ensure that all the schools, both public and private ones, were provided with basic ICT tools. They aimed to integrate a national portal in all the schools to allow communication between teachers and the learners and to share materials. However, the national portal was discontinued, as I will describe

later. The private schools were more committed to technology use, probably in order to attract parents of potential learners. One of the initiatives was to use Classera in their schools.

This thesis is driven by an interest in ICT in general and particularly in e-learning system and in how schools can integrate ICT successfully.

1.1 Purpose and research questions

This study investigates the use of Classera in Secondary Saudi girl schools (private and international) in order to explore the following research questions (RQ):

RQ1. To what extent do teachers use Classera in private and international Saudi secondary schools?

RQ2. What encourages teachers to use Classera?

RQ3. What constrains teachers from using Classera?

The general aim of this study became distilled into the overall question which is **Does Classera have a future in secondary schools in Saudi Arabia?**

1.2 Background to the study

Having explained my personal interest in this topic and given some of the rationale for the use of ICT, I will now describe the educational system in Saudi Arabia (SA) and the policy context around the ICT.

There are some differences between international, state and private schools in SA. The first variation is that public schools are controlled by the Saudi government which offers free education, while private and international ones have private owners who set different fees

based on the reputation of the school and the facilities that are available in the school. In most cases, the international school fees are higher than the private ones. Secondly, the private and international schools often have smaller class sizes; in state schools there are typically around 40 learners in each class.

The pattern of the school year and the curriculum looks quite similar in both public and private schools but international schools have more flexibility. The academic year is divided into two semesters. Each semester takes 18 weeks. In each semester, the teachers in private and state schools are required to complete an assigned curriculum by a certain date. One way the Government controls the curriculum is through providing the textbooks. These textbooks are free for all of the private and the state schools and they have to be followed. The formal education system in schools is divided in to four stages including kindergarten, primary, intermediate and secondary level. Kindergarten educates children from age three to six years; the primary level covers the age from six to 12 years. The intermediate stage provides education for learners between 12 and 15. Finally, the secondary level also takes three years and covers ages between 15 and 18 years. All schools have seven periods per day, each of 45 minutes. As for examinations, students are required to take mid-term and final exams to evaluate their progress. The learners in the intermediate or secondary schools will be required to resit the year again if they fail to pass their exams. Assessment in primary schools is formative and carried out continuously. After completing formal education, learners are required to enter a test called “Qudrat” and their grades will determine their future enrolment to universities. Thus, secondary school teachers prepare their learners for that test. Teachers are required to write in their logbook the methods to be used and plans of how each lesson would be undertaken. This helps the supervisors to check whether the teachers are following the curriculum plan and are using strategies

suggested by the Ministry of Education. (In general, each teacher will teach four to six classes per day.)

In SA, most of the international schools are accredited by the AdvanceED organization. This is a quality assurance mark and based on internal and external review by the International Register of Certified schools. The schools in my study were so accredited. In regard to the curriculum in the international schools, there is more flexibility and classes are taught in English except for the Arabic classes.

1.3 Ministry of Education and ICT use

In 1985, ICT was initially introduced as a subject for Saudi special advanced secondary schools and then in 1991 the Ministry of Education (MoE) made ICT a compulsory subject and a part of the secondary school curriculum for both of boys and girls. This was considered as a first phase of the utilisation of ICT in the country. In the second phase, the teachers began to integrate ICT into teaching and learning as a result of the increased commitment of the MoE to develop ICT infrastructure and to employ it in education. Two further steps were taken by the MoE to increase the integration of ICT in education. Firstly, ICT was introduced in the primary stage as a compulsory subject. Secondly, a project called the National Centre for E-learning and Distance Education was launched, which aimed to spread e-learning and its application in the educational system. This project led to the establishment of the Saudi electronic university in 2011, which offer distance learning and online degrees for Saudi nationals; in 2014 around 40,000 of the learners studied there. There were also some efforts made in the public school sector. In particular, in 2007, King Abdullah launched a national strategy for school reform. A number of projects were involved including The Teachers Qualification Programme, The Development of the Curricula Programme, The Development of the Educational

Environment, and The Support of Extra-Curricular Activity Programme. Relevant to this study, 50 schools were chosen from all educational districts and called the Smart Tatweer schools to serve as a pilot for the Tatweer programmes (Tatweer, 2008). These schools were provided with a number of advanced ICT tools including: a digital library; a laboratory with software, hardware and internet; Smart Classrooms with updated equipment and Activity Rooms for training practices and other activities (Tatweer, 2008). All these schools were linked to the Tatweer VLE.

Four main functions were offered:

- The Midan LMS for managing the learning and teaching process. This allowed communication between teachers and learners, teachers with their colleagues and learners with their peers.
- Virtual Classroom. This allowed teachers and learners to organize classes outside the school.
- Tatweer Educational Encyclopedia. This allowed users to upload learning resources.
- Discussion forum. This allowed communication between teachers and learners of Tatweer schools.

The main aim of Tatweer was to develop a national educational VLE, to improve the learning environment and provide digital curriculum content. The Tatweer project team was responsible for constructing, designing and solving problems faced by the users (Tatweer, 2011). However, the 50 schools that took part discontinued using the VLE. A new minister had assigned and wanted to start from scratch. One of the changes was the establishment of a company (Tatweer Holding Company) to work in cooperation with MoE. Another change was a new education strategy in which all schools would become a Tatweer schools. The new strategy applied to 295 schools. 30 schools from each district and five schools from each school level. Then in 2013, the number of the schools reached

900 (Tatweer, 2013). However, the strategy was based solely on the use of the Midan system with the focus on administration tasks, uploading learners' assessment and performance. It was no longer about teaching and learning (Tatweer, 2012). At the end of 2013, a new Minister of Education came in and took up some of the original goals of the Tatweer project. The Ministry offered $21 billion to reform the Tatweer Project. This new initiative aimed to link all the schools with internet access and provide e-learning systems. In 2017, the MoE aimed to trial two different VLE in the schools. The first was with the cooperation of Tatweer Company and known as (iEN). The MoE selected seven schools to pilot that. The second was also in 2017. The MoE cooperated with Tatweer holding Company and with the Classera company to introduce a programme called the Gate of the Future for state schools. They aimed to introduce the programme over the three different age group over a period of three years. Initially, in the academic year of 2017 and 2018, 150 schools had been selected from three different regions to participate in the study. This was then followed by the second phase which involved 1500 schools. The third phase of the programme would be conducted in the academic year of 2018-2019 and would involve the remaining schools.

These later initiatives would provide informative and interesting materials for a research project. However, they only began after the current research was started and there have been no open publications from them. Moreover, political sensitivities make it very difficult to research these aspects independently in the shorter term. However, in a parallel development, private schools and the international schools had for themselves identified a VLE which was developed by Saudi IT professionals in America and gave them a similar functionality to Tatweer. Classera was developed for private schools and the schools had to pay for using it. It was later expanded in a number of schools and this is the subject of my investigation.

1.4 Saudi Teachers

The total number of alumni with bachelor degrees in 2017 reached around 715,459 of which 56.7% was female (www.moe.gov.sa). For reasons of vocation and restricted access to other occupations, many female alumni wanted to develop education careers. Again in 2017, public schools hired only around 5000 teachers (both male and female). Only a small proportion of female alumni are able to get jobs in the sector (www.mcs.gov.sa). This indicates that there is a lot of competition to gain a place in the public sector. The government keeps a waiting list of qualified teachers. The average waiting time to get a position may be more than five years. As a result, a large number of applicants who are on the waiting list work in the private school sectors until they get place at the public sector where the salary and job security are higher.

An important recent development in Saudi schools has been a policy of Saudization. In 2017, The Ministry of Labor and Social Development set out a policy of Saudization in private and international schools. This was a recognition of the increasing number of unemployed teachers in SA particularly amongst females graduates. A programme called "levels" would force owners to employ more Saudi teachers in the private sector.

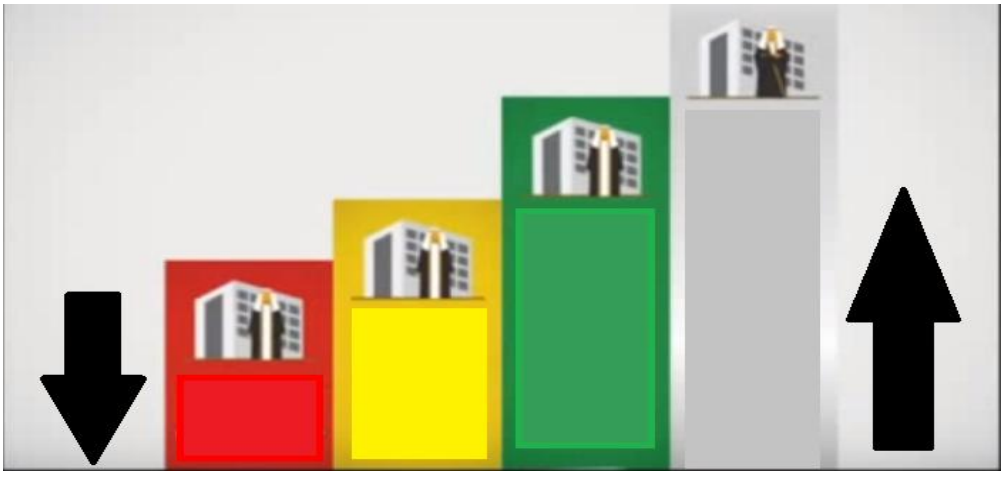

Figure 1-1 The scales of the programme levels

In this programme, there are four main levels as it shown in figure (1.1): platinum, green level, yellow and finally red. These different levels reflect the number of Saudi teachers employed. The classification was based on the number of Saudi workers the school employed. For instance, a school, which employed a large number of Saudi teachers would gained the Platinum level (the exact number differed depending on the size of the school). Schools with platinum or green levels gained more support from the Ministry than other levels. This policy has not really affected international schools who continue to employ large numbers of international teachers. In 2017, the Ministry of Labour estimated the percentage of Saudi teachers in private sectors and found 90% of teachers were Saudi. In contrast, only 15% of teachers in international schools were Saudi.

1.5 Context of the study

This study took place in two international and three private schools in SA. These were five different female schools at secondary level in three different regions in Saudi Arabia. The participants of these schools were schoolheads and teachers. In terms of background, all the headteachers that participated were female and from Saudi Arabia. However, teachers came from different countries (for example Egypt, Syria, India, Jordan and Saudi Arabia). These schools shared some aspects but differed in others. In term of similarities, all of the schools were located in SA, were private, female schools and taught all of the school levels beginning with the pre-school through to the secondary stage. Additionally, they were all using Classera but at different levels. In terms of the infrastructure, all the schools had laboratories where computers could be used under the supervision of teachers.

Case study A was a private school with different branches located in the south western part of Saudi Arabia. The school was well-known and had a good reputation. They had been using Classera for about four years. It offered the Ministry of Education curriculum. In terms of availability of ICT, there were internet connections and projectors in all of the classrooms.

Case study B offered two teaching systems (American standard and Ministry of Education curriculum). The private school was accredited by Ministry of Education while the international part was accredited. The school was well known locally and, as reported by the teachers, most of the learners were well-off. Arabic, religion and social science subjects where taught for both system in Arabic. However, the Arabic and religious teachers mentioned that they taught only 50% of these subjects to the American Diploma learners to provide them with the basic knowledge of Arabic language and Islamic religion. All other subjects were taught in English. In comparison, according to the Ministry of Education system, all the subjects should be taught in Arabic and follow the sequence of the lessons that had been assigned by Ministry of Education for each semester. However, the teachers of the international school had the flexibility to choose the lessons from each subject, were able to change the sequence of subject plan and had had no connection to the Ministry of Education supervision. As headteacher of this system explained, when she observed the classes, she focused on the learners, their interaction and comprehension but not on checking if the teachers were following the plan as is the case with Ministry of Education supervision in the other system. In terms of the infrastructure, there were no differences between the classes in the two systems. All the classes were provided with internet access and projectors. At the time of data collection in SA, the school was starting to use Classera; they had been using it in only three months.

Case study C was a private school. They had been using Classera for three years. The school offered projectors to each class and a computer lab in the school. However, the internet access was in place only for the administrative work but not for the teachers and the learners to use in the classes.

Case study D was a private school. The school principal was determined to use ICT in her school. She replaced all of the traditional boards in the classrooms with interactive ones. The school provided the teachers with workshops in how to operate interactive boards in the classes and they received hands on experience during the lessons. Internet access and projectors were provided for all the classes.

Case study E was an international school and was one of the largest and most well-known school in SA. It has different branches around the country. The school offered a British curriculum only. The school was teaching all subjects of the secondary level from the Cambridge International Examination Board IGCSE Syllabuses. IGCSE curricula are designed particularly for worldwide schools. The main language that was spoken in the school was English. This school was accredited by the AdvanceED company. Classera had been used in this school for two years. In regard to the infrastructure, the school offered internet access for all the teachers to use in the class and projectors in all the classes. In respect of fees, all these schools charged fees and the level of fees ranged from around £3,000 to £6,000 per year.

1.6 The significance of the study

The MoE attempted to change the educational system of Saudi Arabia by integrating ICT use in to the teaching and learning process. One of their initiatives was the implementation of Tatweer portals into some schools. However, this portal had failed at the trail stage and

is no longer used. The Ministry of Education is still interested in providing Saudi schools with a national e-learning system and attempted recently to trial another national portal called IEN. Thus, I hope to contribute explicitly to Saudi education system and be part of the reform process by investigating the use of the e-learning in private schools to provide the Ministry of Education with more information about the factors that need to be addressed to develop a national e-learning system in Saudi schools and to understand the future of using such tools. My study addresses a research gap as there is a lack of Saudi studies in this regard. Using this context, my work is intended to further develop understanding and to add to the wider literature (chapter 3) to represent a new view which shows that ICT in itself will not transform schools. Such transformation requires leadership, an appropriate strategy and an element of agency.

1.7 Thesis layout

The first chapter of this thesis has introduced the study, highlighted the purpose and the research questions, provided some information about background to the study and the school contexts. Chapter two covers educational portals, discussing the types of virtual learning environment, functions and tools available and the reported value of using VLEs. It then describes the VLE used in this study, illustrating the intentions of those designing Classera and their ideas about its potential in Saudi schools and its take up. Chapter three provides an overview of the literature about the factors that play a key role in successful integration of ICT in schools. Chapter four describes the methodology of the study, the design of this study, data collection methods and data analysis procedures. Then, the same chapter provides information about evaluation of the instruments and ethical issues. Chapter five presents data analysis and findings from the quantitative data collection (questionnaire). In the same chapter, the differences between the schools and their use of

Classera are shown. Chapter six presents data analysis and findings from the qualitative data collection (teachers and heads interview) and observation data. In chapter seven the findings of the study will be discussed, in the light of the research questions of the study and the main question of “Does Classera have a future in secondary schools in SA?” will be addressed. This chapter concludes by linking this story of Classera with the wider issue about ICT and education change. Finally, chapter eight concludes the study and offers some recommendations, reviewing the limitations and strengths of the study.

Chapter 2 About Virtual Learning Environments and Classera

2.1 Introduction

This chapter reviews Virtual Learning environments (VLEs) in general and provides a background to Classera including the functionality that it offers to learners, teachers and administrators. It also illustrates the intentions of those designing Classera and their ideas about its potential in Saudi schools and its take up.

2.2 What is a VLE?

There has been little consensus in the literature about how the terms learning platform, VLE and Managed learning environment (MLE) are used. Hammond (2010) found that the term MLE has been largley replaced by VLE. He also found that most of the researchers agreed that aVLE should:

- Provide access to learning materials (e.g. files, web pages capable of multimedia formats) and signposting to the material through menus, bulletins, overviews, and, in learning activity management systems (LAMs), detailed curriculum mapping
- Contain opportunities for communication and collaboration between learners and between tutor/teacher and learners (both synchronous and asynchronous) again capable of different media and including student generated content e.g. Wikis, web pages
- Contain opportunities for assessment and assessment management, tracking of result and progress through, e.g., online testing, posting of assignments, formative and summative feedback on assignments with teacher control over the system and differential rights to data
- Offer provisionality e.g. all data is amendable
- Be Web browser based but password protected, again with differential rights of access
- Be integrated so that there is a consistency between the different parts (p.5,6).

The term learning platform (LP) was preferred by some in the UK, especially by British Education Communications and Technology Agency (Becta) at the time. LP was used to describe a broader description of a system (or mix of software) that offered support for teaching, administration, management. According to Barajas & Owen (2000), VLE is “any combination of distance and face-to-face interaction, where some kind of time and space virtuality is present” (p. 40).

Dewhurst & Ellaway (2005) identified three forms of VLE. One of these forms is off-the-shelf systems which are commercially provided and supported, though often difficult to adapt. Examples include Blackboard and WebCT. A second type covers purpose-built systems and these systems are designed and developed to meet local educational needs. A final type is open-source systems which are freely modifiable such as Moodle. According to Becta (2008), LP contains a collection of tools that are designed to offer support for teachers and learners to have access to content mangement, administration, communication tools, tools for assessing curriculum engagement and curriculum mapping. Hammond (2010) added that by using an LP, schools are being asked to use a new approach but not as a product. Therefore, Hammond concluded that VLE is an example of LP but a LP should not necessarily be a VLE. A third commonly used term is that of portal, which has been used by some writers to describe the functionality of a VLE.

There is a lot of literature around VLE use in Higher Education (for example, Aljuhney (2017); Ghavifekr & Mahmood (2017); Arfeen & Noor (2017). This is relevant to VLEs in schools as they indicate some of the likely opportunities and difficulties in VLE use. However, the situation is very different between schools and Higher Education. For example, class sizes are much bigger in Higher Education and time for face-to-face teaching is considerably reduced in comparison to schools. It is normal for Higher

Education courses to be supported by Web pages and online resources. In schools, on the other hand, typically class sizes are smaller and teaching takes place over longer periods. Teaching is very much a face-to-face activity. Therefore, caution should be exercised when transferring findings from Higher Education into a school context.

2.3 Examples of VLEs in schools

VLEs can be designed at a national level to link a range of schools or they might be created particularly for selected schools (Pynoo et al., 2012). Many countries have attempted to transform their educational system by introducing national 'portals'. For example, the National Educational Portal in Peru (Paola, Feroz, Moon, & Jeung, 2011), KlasCement in Belgium (Pynoo et al., 2012), Frog in Malaysia (Garba et al., 2015); WizKid designed by UK local county councils for local schools (Boulton & Waters, 2015), Mashov in Israel (Blau & Presser, 2013) and ekool in Estonia and Sweden (Selwyn, Banaji, Hadjithoma, Garstka, & Clark, 2011).Typically, these initiatives are aimed at innovation. For example, Frog was introduced in Malaysia in order to create a '21th century learning environment'. Saudi Arabia provides another example of a country seeking to reform an educational system through designing a national portal. This was the Tatweer program that was designed for learners, teachers, headteachers, and supervisors to support learning, to share, communicate and to find learning recourses. Government policy in UK also aimed to promote the use of LPs by all primary and secondary schools (Boulton, 2008). They wanted learners to have personalised online learning access as well as parental access to online information to follow attainment, attendance, behaviour and particular needs of their children. Another example is that 37 Qatari schools used an educational portal called the Knowledge-Net (K-Net). This began in 2008 and aimed to engage learners, teachers, administrators and parents in one system for data storage, sharing, and data administration.

These initiatives have had mixed outcomes. For example, Pynoo et al.(2012) investigated teachers' use and acceptance of KlasCement using online survey and usage data (number of logins, downloads, uploads, reactions and pages viewed). They found that teachers employed the "portal'' to search for and download recourses but not to share or upload information. They further noticed that most of the teachers ignored the advanced functions that could add value to learning. Ofsted (2009) distributed a survey to different contexts including primary, secondary schools and to adult education institutions and 34 higher universities to investigate the effectiveness of using VLEs and found that LP systems were only being used to store but not to the fullest extent possible.

Garba et al.(2015) investigated the use and the infrastructure of ICT in Malaysia and found that although the ICT infrastructure was available and teachers had acquired ICT skills, teaching and learning had not changed as desired. Meanwhile Shashi (2016) investigating the adoption of e-learning in Malaysia found a low take up of the Frog portal.

As seen earlier, the Tatweer initiatives also had problems. Binothman(2015) investigated four different schools which had implemented Tatweer at the trial stage. She used both quantitative and qualitative methods in order to examine teachers', learners' and senior managers' perspectives and found that all users accepted the portal. The portal was used mainly for communication and information. However, the initiative was not continued. Binothman concluded her study with two main implications for policy makers. These were to revise the policies of the Portal Project to meet the aims of the new education strategy in SA and to extend the trial perioqd to allow teachers and learners to experiment for longer with the system.

Nasser, Cherif, & Romanowski (2011) investigated learners' perspectives towards Knowledge-Net in Qatar via a survey of 1,376 students and some follow up interviews. The study found that although learners had all skills needed to use LMS, the use of Knowledge-Net was very limited and mostly was focused on playing games and communication rather than for educational purposes. Nasser et al.(2011) argued that this was due to a number of factors including that the LMS was less attractive or useful than other Web sites. Nasser and his colleagues further concluded that there was an inverse correlation between knowledge of ICT and portal usage so that the more learners knew about ICT, the less prone they were to use Knowledge-Net. They suggested that LMS might need to adapt to catch up with popular technology to become more usable for future students. As Anderson & Blackwood (2004) indicated, the rapid technological changes taking place in society might lead many students to consider the LMS to be boring and "backward".

2.4 The Value of using VLE in schools

VLEs offer opportunities for new types of communication and administration and new approaches to learning. Jewitt et al.(2010) saw these opportunities as leading to 12 types of outcomes which they found evidence for:

1. Improved organisation of information and communication across the school (make a range of information quickly and easily accessible, including aggregating data and reporting to all staff, sharing school news as well as informing teachers, governors, learners and parents of rapidly changing events).
2. Increasing parental involvement and supporting learning at home.
3. Increased opportunities for independent and personalised learning.
4. Enhancing the accessibility, quality, relevance and range of learning resources.
5. Improved processes of monitoring and assessment for learning and teaching.
6. Increased opportunities for collaborative learning and interaction.
7. Enhancing digital resources.

8. Making best use of teachers' time.
9. Facilitating effective and strategic leadership and management of teaching.
10. Supporting additional educational needs and inclusion.
11. Improved management of student behaviour and attendance.
12. Building the school identity and community (Jewitt et al., 2010, p.6-7).

A focus here is the idea of innovation. Jewitt and many other researchers such as Nguyen (2015) saw VLEs as leading to new forms of collaboration among learners, helping the development of learning communities and promoting creativity, enjoyment and motivation. For example, the collaboration to design and distribute an online school 'newspaper' where spaces for the text are provided, opportunities for communication and receiving feedback through online voting. A second focus is that VLEs enable opportunities that were not feasible before, for example, pedagogy such as blended learning (Nguyen, 2015) and flipped classroom (Elmaadaway, 2018). Elmaadaway (2018) investigated whether the use of a flipped classroom approach with an e-learning system (Blackboard course) at a Saudi university promoted learners' perceptions toward levels of engagement and skill performance. In his study, he found that such integration helped learners acquire different skills. Both blended learning and flipped classroom are based on the idea that students could access resources outside of the physical classroom; e.g., videoconferencing which facilitated the work between learners and an artist as part of a virtual residency. In a similar vein, Younie & Leask (2010) spotlighted activities such as learner podcasting; video conferencing; blogging; and online testing which had been undertaken in schools that used learning platforms. Mclaughilm et al. (2014) & Gilboy et al. (2015) placed a series of video lectures online for a pharmacy course and found that learners preferred using this approach rather than traditional lectures, where it helped them in achieving the principles of active learning. In other words, class time was advocated for questions and presentations.

Learning in schools is typically face-to-face but the VLE can be used in a blended approach. Osguthorpe & Graham (2003) defined blended learning as combining face-to face teaching with distance delivery systems "… but it's more than showing a page from a website on the classroom screen…those who use blended learning environments are trying to maximize the benefits of both face-to-face and online methods." (p. 227). This calls for a deeper level of pedagogical understanding than simply uploading Power Points.

Some of the opportunities cited by Jewitt et al (2010) concern efficiency and the saving of time. For example, providing easier access to learning resources and tracking of learners' work as well as access to an up-to-date management system. Others are about increasing engagement between parents and their children and helping schools involve parents more in the life of the school and enabling to answer parental enquiries more quickly. For example, 'an online parents' evening.

There is a challenge in the take up of all of the technology which we will look at in the following chapters, but there are some issues which appear more relevant to VLEs. One of these issues seems to be the sustaining of initiatives. Some educational systems, including in the UK and Saudi Arabia, promote VLEs but then drop initiatives as government changes. A second difficulty is about generalizing practice. For example, Becta focused on initiative practice in a selected number of schools. This report gives little indication as how far these initiatives had been generalized. It seems also that a common picture is that only some of the functions of VLE are used and opportunities for innovation are missed. Third, automatic assessments and quizzes offers opportunities, but this type of assessment has rarely been recognized as valuable in the past. Hammond (2010) pointed out, addressing challenges such as validity of testing, investment of time in test design, avoiding useless attention on drill and practice and creating material require a great deal of time and

expense. Fourthly, VLEs are not seen to be as attractive as other web resources and this may lead to some resistance to using them. Finally, efficiency gains need to be viewed critically; even in the most optimistic reporting where VLEs are often seen as saving time, there is a sense of work expanding and this being time-consuming for administrators, teachers and for leaders. For example, if a school wants to engage parents more fully, there will be an expansion of their workload. If a school wants to promote discussion forums, this can eat into teachers' free time and can generate serious issues of moderation and monitoring. The schools participating in Boulton & Waters's study (2015), for instance, had concerns about the burden placed on their teachers while using VLEs, where teachers had needed extra time for more training and using ICT.

Ferdig et al. (2009) found that within an online environment the teachers' roles should be expanded and modified. Davis et al. (2007) and Ferdig et al. (2009) identified different roles teachers undertake in a virtual school environment. According to Ferdig et al.(2009), teachers are not only responsible for teaching and interacting with the learners within the online contexts but also should be: a course facilitator providing support for the learners; an instructional designer who creates material online with effective learning strategies; a local key contact to support learners accessing virtual courses; a mentor who offers tutoring; a technology coordinator who provides technical support for both their colleagues and learners; and an administrator. We can imagine that if teachers in a virtual school have a huge responsibility then blending face-to-face teaching with online learning would make teachers' roles much more complex.

2.5 Introduction to the Classera Portal

Classera is a virtual learning environment which offers a mix of functionalities in one system. The portal provides five key functions which I have grouped below:

Communication

Discussion boards: this might support communication between teachers and their learners, and within groups restricted to teachers and to learners.

Automated E-mail and SMS Notification System: this allows the schools to send to all users information about school news or events and notify parents about their children's' attendance and participation.

Internal Messaging System: this allows communication between school members such as between teachers and their colleagues, teachers with the learners and learners with their classmates.

Alumni Club: this allows the school to communicate with their learners who have just graduated from the school and follow up on their progress in their professional lives.

Administration

Student information system: this provides data about all students' attendance, behavioural records and schedules.

Teacher management system: this offers administrators information about teachers' attendance, performance and schedules.

Financial Module: this helps to communicate directly with the accounting department in the school, to manage balance sheets for all the school's learners and to process transactions such as receipts.

Learning

Distance learning (virtual classes): this allows teachers and their learners to arrange classes out of the school hours.

Questions Bank: this provides many exercise questions for the teachers to use.

Real time exams and assignment monitoring: this allows teachers to set tests for learners and to time those tests from the moment they log on. As regard assignments, this allows students to submit their assignments to meet the deadlines.

Custom library: this is a bank of materials created and shared by teachers who are users of Classera.

Reports

Grade Book and Transcript Management System: this keeps records of learners' grades.

Electronic Certificate: this issues a certificate for rewarding teachers of their frequent use or for workshop attendance and verifies it by unique code and verification link.

Survey Module: this allows the schools to create a questionnaire, distribute it to all school users and collect data. For example, the school might use it to let the learners evaluate their course.

Business Intelligence Module: this helps school managers by providing up to date data.

Rewards and encouragements

Points and rewards: teachers and learners gain points when they participate or use any activity in the portal. They can check their point’s totals through their profile page. The users who gain the highest points can get discounts from restaurants, entertainment places, etc.

Excellence Badges: based on learners’ performance, outstanding learners for each subject will be given badges and winners will be announced to everyone using the portal.

Classera Talent Club: outstanding learners are provided with free membership to this club and receive trips, courses, etc.

Educational Games: this involves educational games that support learners in key subjects

2.5.1 What the learners see

Learners need to be given a username and password to log on and they then see 11 main icons, as shown in (Figure 2-1) Rather than talk about each one individually, I have grouped them in to four kinds of activity **Tasks, Social communication, Teaching material** and **Report**. Each of these will be illustrated in more detail in the following sections.

Figure 2-1 the main Classera page for the learners

The first theme is **Tasks** which include Assignments and Tests. Teachers are responsible for creating tests and homework tasks and stating the submission date for these tasks. The tasks may be created in multiple-choice formats, in which case they can be set to provide automatic feedback. The teachers can also set open-ended questions. The main difference between tests and homework is that tests are timed.

The second theme is **Social Communication** which involves an Email Box and Discussion Board. The mailbox includes learner's inbox, sent messages, draft messages, archived messages and an auto search in which learners can find the e-mail they are looking for through searching by the sender's name and e-mail's subject. The students can send emails only to the teachers that are identified on their list and to Classera administration teams. Teachers can trigger discussion on the discussion board, by posing questions or a short quiz. This gives learners the opportunity to view other learners' responses and opportunities to participate and add new posts (see Figure 2-2).

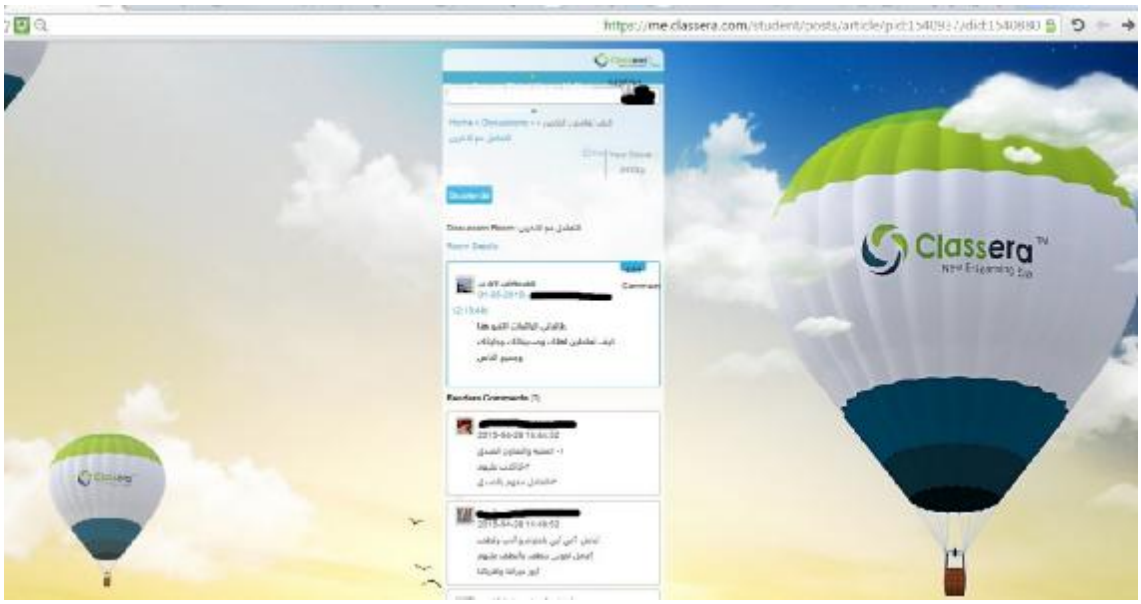

Figure 2-2 example of discussion board between teacher and their learners

The third theme is **Teaching Material** which involves Course Material, Video Lecture and Smart Classes. Course material includes documents (for example, papers, worksheets, PowerPoint presentations, etc.) that have been uploaded by the teachers and made accessible to students. This means that learners can download the material to their computers. In the Video lectures, teachers can upload any videos that might be useful, for example You Tube clips, or they can record their lessons and upload them. Smart classes

allow teachers to arrange times with their learners to teach a lesson using video link up, this is designed in particular for those who have missed lessons at school.

The final theme is **Reports** which include grades, Report cards and Assessments. The grade section provides the learners with their marks for assignments and tests. The learners can print their grade form or transform it into a pdf or excel file.

The learners have 'click on' options at the top of their initial screen that assist in navigation through the system but also introduce some new functionality: home page - courses - digital library - smart classrooms - weekly plan - schedule and attendance.

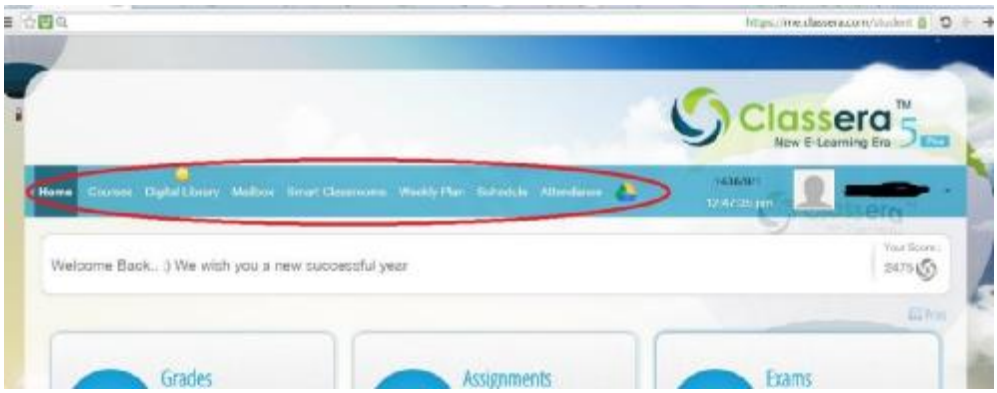

Figure 2-3 Classera menu bar

The **Courses** section shows the learners all the subjects they are studying and facilitates access to course materials, lectures, tests, activities and assignments.

The **Digital Library** includes ten different libraries: interactive lesson; video library; audio library; document library; presentation library; software library; flash library; game library; website library; and photo library. In these various libraries, the teachers can either upload material offered by Classera or upload whatever learning materials (e.g., websites, PowerPoint presentations, videos, recorded sounds, Word documents, etc.) they think are

relevant for their learners. The students can write comments or questions under each uploaded item and send it back to their teachers.

The **Smart Classrooms** page displays schedules for old and upcoming smart classes. The weekly plan shows the learners the schedule and lesson objectives, attachments, comments, tests and assignments that have been set for each week. The schedule part indicates the lessons plan for the whole term.

The **Attendance** section provides data on daily absence, course absence, an absence summary and a course absence summary. In the daily absence part, the learners can insert the date and the reasons for their absence. While in 'one lesson absent', the students can specify which course they are not going to attend and indicate the reasons for that. The absence summary shows the learners the number of the days that they were absent with excuse and the total absence.

In relation to other virtual learning environments, Classera is relatively 'friendly' to use and its icons and menu options appear relatively easy to navigate. However, its comprehensiveness is also a difficulty in that it can appear quite overwhelming at first, especially as some of the functionality is unlikely to be used. In comparison to other approaches, for example Moodle and Blackboard, it appears similar in many ways but also more ambitious. Its range of functions covers most potential uses, but perhaps it has not been designed with an understanding of what teachers and learners are likely to use most often. For example, it does not provide students with their own spaces such as for their own blog or a portfolio. Although at this stage there is not much interest in these students' spaces, this could become a significant gap in the future.

My personal perspective on Classera, is that it appears quite clear. If I was a pupil in an ideal world, I would have the opportunity to access various sources of information that

would facilitate studying. I would have less to carry around and easier access to assessments. However, Classera would look like learning rather than having fun.

If I were a teacher, I would have an opportunity to access other teachers' ideas and this might help me to develop my own teaching. On the other hand, it might ask more of me and using Classera fully might become a burden.

If I were a manager or a head teacher, I would have an opportunity to get ready access to teaching and learning data and so gain a greater sense of control. Recognizing the strength and the weakness of the learners' performances might help in developing the school.

2.5.2 **How Classera is presented**

I looked at the rationale for Classera on its own web site, initially on YouTube. In these videos, they make much play of modernity. There is a picture of a boy who is learning letters by holding a slate board, the idea being that we are living in a modern world but the teaching processes have stayed the same (Classera, 2013). With Classera teaching is more modern. The first part of a video showed a teacher standing next to a chalkboard and on the other side of the picture the children are wearing headphones and holding iPads. Classera showed people are using technology but the teachers are still using traditional teaching methods.

The main themes of the presentation are: its ease of use; its 'intelligence' (Classera provides a graphical representation for the performance measures); inclusivity (the headteachers, the teachers, the learners and the parents are connected); access to resources; supportive (Classera helps learners to identify their strength and weakness); innovation (here it is claimed that Classera makes learning fun and can break the traditional module); encouragement (here it is claimed that Classera rewards high users).

The number of the schools that are using Classera

Classera was specifically designed for schools in the Middle East by Saudi designers. According to Classera, in 2017 there were around 150 schools using the system in the Middle East, mostly private schools. At the time of data collection, Classera did not have a main rival although a great many VLEs designed more for the American market existed (e.g., Blackboard, Moodle, etc.). Classera was given a boost when one of the most prestigious schools in Riyadh, which the son of King Salman attended, took on the use of Classera. Due to the war between Saudi Arabia and Yemen in 2015, Classera had introduced an initiative to provide virtual classes for the children in the affected zones.

2.5.3 The belief and the views of Classera director

In order to understand the thinking behind the construction of Classera in more detail, I went to the company that designed and promoted it in Saudia Arabia, meeting the people who worked there and explaining about my main research. The original designers were not available for the interview, but they put me in contact with the local director, who had worked with the Classera founder at the initial stage. It proved impractical to arrange a face-to-face meeting with her, but I was able to conduct an online interview.

This interview raised questions of methodology and method which are outlined more fully in respect to interviews and data analysis in chapter 4. However, I want to include details of the interview here as it provides an early overview of why Classera was designed. In carrying out the interview, I was aware that commercial interest might make her exaggerate the take-up and down play difficulties; she is to speculating somewhat on the designers' intentions (she was not the designer) she might simply be an IT enthusiast and offering an optimistic scenario. However, I felt that the interview was reliable as she was open about difficulties; there was no commercial value in offering the view of the designers and she

suggested some schools that were not using Classera more frequently. The data has been presented from the interview around the themes that will be discussed in the following sections.

From this interview, I was able to understand how Classera people saw the product and what they saw as benefits and difficulties in promoting its take-up. Classera was developed by two Saudi students studying in the USA who had seen the use of VLEs and wanted to develop a system for the Middle East. The director believed that Classera could be used at any university in the world, but she found that the system was more suited to schools. It was provided with two language fonts, English and Arabic. She said that Classera had been used in American schools and British schools in Saudi Arabia, in addition to state and private schools there, and in other Gulf countries, such as Qatar, Doha and Dubai. They would extend its use soon to other Arab counties such as Jordan and Egypt.

She believed Classera could be used both in and out of the school but she found most of the learners were using it only at home. From her point of view the reason why it was not used in school was that schools could not provide each student with a computer or a laptop of their own. However, she believed that teachers with their own devices could use Classera inside the school to download tasks and documents for their students.

She explained the big idea of Classera was to introduce an electronic educational system that " breaks the routine and breaks the concept of 'boring education'." by using the internet. From their point of view, they tried to create something that was going to make education 'more fun' where learners had the same degree of suspense and excitement as they had with video games. She also put a lot of emphasis on doing away with heavy textbooks, As she said: "people among this technology oriented generation are completely convinced that they can be more successful and innovative in their education without the

use of textbooks and notebooks. When we looked through all the programmes and electronic means of learning, we found that most of these are used as a tool to make the students perform their educational tasks and school work on a computer instead of using a notebook and that the correction becomes electronic rather than manual; from here, came the idea."

Consistent with the online publicity, she believed that Classera provided smart analysis. For her this meant that Classera could analyse weaknesses and strengths of the student and improve the weaknesses gradually without the need for intervention from the teacher or the school.

Another important point for her was gamification. She believed Classera provided gamification that was different from play within informal settings. From her point of view, students who achieved high scores in Classera would be given reward points and could benefit from these points by getting discounts for places of entertainment, educational centres, health centres, sports and swimming facilities. She also believed that gamification in Classera would make the students 'addicted' to the game and compete with one another in their class and then in their school and so on until competition gradually reached regional and global levels. They believed that this would help the learner to learn 'subconsciously' She also believed the Classera's library allowed the learners to view all the explanations by teachers involved in the programme from all over the Middle East.

She also saw the programme helping the teachers in different aspects. From her point of view, the teachers could look up the explanation by any teacher by name using the library and could display everything related to this teacher, including lesson instructions and worksheets. She thought that allowing teachers to communicate through the library would

making the system focused not only on education and could become something like Facebook.

She also believed that Classera had important record keeping functions as described earlier. She believed that using Classera would be time saving for the teachers. For example, she said that Classera would give the teachers the opportunity to choose a lesson from a list and Classera would supply the lesson plan. However, she recognized that supervisors were visiting schools from time to time and so each teacher should have their own preparation notebook.

When it came to the take up of Classera, she found that Assignment, Exams, Video lecture, and Course material were more widely used. She found few examples of classroom filming, although this happened in one or two boys' schools. She found the feature to upload tests was almost exclusively used to upload supplementary material questions, but not used for tests themselves. As she said: "I mean final tests and mid-term tests. The reason is that the Ministry of Education still requests students' progress to be monitored manually." She had found that Discussion rooms, Classera library and Virtual Classrooms were not widely used.

Training was important part of developing the use of Classera. The organization provided training for students, teachers, and headteachers. She believed that each school needed six hours of initial training to use the system. She believed that learners would use Classera easily because they were adept with technology and played with electronic games without the need of formal help. In addition to the workshops that Classera provided, the director mentioned that they were providing other support files and videos designed to help teachers to use Classera.

When it came to discussing the costs, she said students in private schools pay approximately from £3000 to £4000 during the year. She claimed that the cost was not prohibitive for private schools.

When it came to discussing about difficulty of the take up, she saw some cultural constraints. She found parents were not interacting with the portal and they were not aware of its importance. From her point of view, parents were apprehensive about the idea of using the internet in education; for example, they had concerns over internet addiction and accessing inappropriate material. She thought this challenge faced all conservative Arab countries and she believed that this would be a big challenge for the owners of the schools.

2.6 Summary

In this chapter we learnt that a VLE is a collection of tools that serve teachers and learners by providing access to content mangement, administration, communication tools, tools for assessing curriculum, engagement and curriculum mapping.

There were opportunities associated with efficiency, innovation, chances that were not feasible before. There were difficulties including the sustaining of initiatives, generalizing practice, type of assessment offered, and not being seen as attractive as other web resources. Finally, efficiency gains need to be viewed critically even in the most optimistic reporting.

We also discovered that Classera was a system, which had some benefits and constraints. There were some weaknesses in the user space, where learners did not had the opportunity to share with their classmates. We also found that the vision of the designers was a very optimistic one which was coming up against the reality of current curriculum and culture.

Many of these issues are common to these technologies in general and we will look at them in more detail in the next chapter.

Chapter 3 Literature review

3.1 Introduction

This review is an attempt to draw out general issues concerning the factors that influence the take up of ICT, in order to inform my study. The chapter is divided into four main sections, which focus on four main themes covering the factors that influence on ICT integration in schools, i.e.:

- **Factors at a teacher's level**
- **Factors at school level**
- **Factors beyond the school level**
- **CPD as a concept**

My review is a narrative one rather than a systematic one. My starting point was to use Google scholar and Warwick library to access articles about my topic. These searches were in English and focused on keywords such as e-learning, educational portals, enablers for successful ICT implementation, obstacles for ICT integration in schools, technology use in education. Although the study is set in a Saudi context both European and Arab studies were accessed. This allowed me to identify the major factors in successful ICT implementation in schools. Although very conscious that Saudi is very different system to most in Europe, at the same time I could see a lot of ways in which the issues were transferable to other contexts. Recent Saudi theses such as AL Ghamdi (2015); Gamlo (2014); Binothman(2015); Zahrani(2016); Ageel (2011); Al Sufyani (2008) & Alzahrani (2016) were particularly helpful in providing information about the current use of ICT there; these were

accessed through the Saudi Digital library. While Saudi articles such as Karim & Rampersad (2017) and Zalah (2016) were accessed and available in Warwick library.

It is interesting to note that some apparently dated works are still relevant and widely cited, such as Nespor (1987) and Pajares (1992). Although Nespor's article is very old, his argument about the impact of their beliefs on teachers' decision making was still picked up in the field of ICT research. I become increasingly aware during initial reading of the ways in which the literature has been framed by the factors that encouraged, or not, teachers' use of technology. In this I found a convincing structure by which to understand the use of technology and I have organised most of this review under these factors.

There is, of course, need for a wider debate about education change and the theoretical frameworks and Models that have been addressed about ICT use that are less well serviced by this review framework based around factors. Hence, at the end of the review I highlight some issues to do with the future in technology and one of the models that have been criticized. However, because of its critical relevance there, the main block of that literature is presented in the discussion chapter (see Chapter 7).

Here I will discuss four main issues on the following sections

3.2 Factors at the teacher level

Becker (2000) and Hsu (2016) argued that for computers and technology to be used four different variables are needed: teachers must (1) have convenient access, (2) have some room in their curriculum, (3) be well prepared and (4) finally have personal beliefs that match with constructive pedagogy concepts. However, not all teachers have these constructive beliefs or work in schools with the three other variables available to them. Notwithstanding this, some researchers have gone on to argue that the first three

conditions have been nearly met but that teachers' belief is the concept that is less understood and not readily resolved. In a widely cited and still influential paper on the way we think about technology, Ertmer (2005) argued teachers' beliefs require change at a second-order level not at first-order one. For example, the initial three variables may require enacting change to current practice in "an incremental fashion" without the need to change beliefs. In contrast, second order change requires a comprehensive change in seeing and doing things.

Many studies have shown the importance of a teacher's role in identifying ICT use in schools. Way & Webb (2007) analysed 400 e-learning grant applications that were used in Australian schools and noted the importance of hearing teachers' voices in them. In other words, teachers need to define a teaching situation and decide what action to take, with or without ICT. Nespor (1987), in talking about teaching in general, argued that beliefs will profoundly impact on decision making and a teacher's teaching, and this was frequently picked up in the field of technology research. For example, Hermans et al. (2008) agreed that teachers' beliefs affected the use of ICT in the classroom and that traditional beliefs about teaching may influence ICT adoption negatively. Meanwhile Chen (2008) and Deng et al. (2014) believed that teachers' pedagogical beliefs had a strong impact in the decisions they took about integrating technology in their classrooms. However, these beliefs might conflict with other beliefs affecting the way they taught. Miller and her colleagues (2003) pointed out that there are three components involved within teachers' beliefs toward ICT: their pedagogical beliefs about the integration of ICT; their beliefs about the perceived value of using ICT for pupils' learning; and finally their self-efficacy beliefs about ICT integration. Bebell & Kay (2010) and Miranda & Russell (2012) found that these aspects are interrelated and considered as a key predictors of teachers' use of ICT at the classroom.

Hsu (2016) used these three components to operationalize the beliefs of the teachers in the United States toward ICT integration. Many researchers (see, for example, Ertmer, 2005) found that teachers who held constructivist learning beliefs were using ICT more frequently and used it to enhance high-level learning such as encouraging collaboration between learners at a distance, engaging learners and supporting their activities. On the other hand, the teachers with teacher-centred beliefs tend to use ICT to support their traditional teaching practices (Hsu, 2016). In regard to teachers self-efficacy belief, Hsu (2016) defined this as "personal beliefs about one's ability to learn or perform actions at desired levels" (p. 31). The teachers' beliefs about their confidence and capacity to use ICT could predict the extent of their integration of such tools in their classroom (Lee & Tsai, 2010). Gong et al. (2004) argued that computer self-efficacy had influence directly on the perceived ease of use and intention to use e-learning systems. Fathema et al. (2015) also agreed that the beliefs that teachers hold about their ability to use e-learning technologies have a potential influence on their acceptance and their use. In respect to teachers' beliefs about the value of using ICT in the learning process, Buquoi et al. (2013) found in their study that teachers with more positive beliefs about the values of using ICT to enhance learning tend to use such tools more frequently than others. According to De Smet et al. (2012) perceived access to technical support had a potential influence on perceived usefulness and ease of use. In other words, perceived usefulness about VLE could been gained through providing technical support. Hsu (2016) used a mixed-methods approach to investigate teachers' beliefs and practices toward ICT and found that there was a consistent correlation between beliefs and practice. Teachers with constructivist pedagogical beliefs about ICT use were more often held a high self-efficacy belief about ICT use and practised high-level learning activities in their teaching. Beliefs are important, but they are not always a reliable guide to behaviour. Indeed, many studies (Calderhead,

1996; Ertmer, Gopalakrishnan, & Ross, 2000; Fang, 1996; Kane, Sandretto, & Heath, 2002) as well as more recent research (Andrade-Aréchiga, López, & López-Morteo, 2012; Chen, 2008; Ertmer, 2005; Judson, 2006) have investigated the relationship between teachers' pedagogical beliefs and their practices. A common theme to these studies is a mismatch between teachers' expressed beliefs and their actual instructional practices. Judson (2006), for instance, found a mismatch between expressed beliefs of teachers about technology use (they thought it was a good idea) and their actual teaching practices (they tended not to use it).

Chen (2008) provided insight into the reasons for such mismatches. He investigated high school teachers in Taiwan and found that they showed a high level of interest towards constructivist concepts promoted in the policies of the Taiwanese Ministry of Education. However, through classroom observation, he found that most of the participants' teachers were not integrating technology into instruction in a way that could enhance collaborative learning among students but were focusing mainly on content coverage. Chen found three main reasons for this: the impact of external factors; lack of teachers' knowledge and understanding about ICT; and the influence of conflicting beliefs.

This leads us back to study of context (Fang, 1996). Many studies have identified factors that could exist in the contextual setting that may cause a conflict between teachers' beliefs and their instructional practices. Taiwanese teachers in Chen's study (2008) identified that lack of computer access and software at the schools, inadequate time for teaching, large number of learners in the classes and lack of technical and administrative support as factors external to teachers. Bullock (2004) saw context as influenced by policy, school culture, and availability of appropriate equipment, training. These could cause teachers to be inconsistent in what they believed toward ICT integration and what they were practicing in

the classroom. Scott et al. (1994) observed 14 college professors in order to compare their beliefs with their classroom practices and pointed out that a "common theme in this research is one of negotiation between what one assumes and believes to be true about teaching and the contextual factors (students, institution, and societal assumptions and beliefs) which serve as enablers or constrainers to playing out these assumptions and beliefs" (p. 23). From this finding, Scott, Chovanec & Young suggested that researchers should consider the potential impact of contxtual factors on teachers' beliefs. Chen (2008) proposed that teachers require support from parents, administrators and colleagues and flexibility in employing assessment method rather than forcing them with pen-and pencil exams in order to enable them to transform their practices toward successful integration of ICT.

Al Nifessah (2007) investigated the use of ICT in Saudi schools and found that there was a considerable curriculum and time constraint. Khouj (2011) also conducted a study in Saudi Arabia schools and found that that teachers were restricted by Ministry of Education policies to cover the syllabus; this made them feel under pressure and to see the use of ICT in their classroom as a distraction. Again in Saudi Arabia, Ageel (2011) found that busy teaching schedules were an obstacle to using ICT.

More light is offered by Zhao & Cziko (2001) in a study of technology integration in schools. They argued that pedagogical beliefs were more highly placed than technology beliefs in teachers' belief system. According to Ertmer (2005) and Green (1971), the beliefs that are core and central to a belief system that formed over many years of experience are more resistant to change. Fives and Gill (2014), on the other hand, pointed out that peripheral beliefs are more recently formed and thus are easier to be altered and that conflicting beliefs might be held by people without noticing such conflict. Pajare

(1992) also felt that each individual could have different or inconsistent beliefs within their own belief system and that belief systems were often inflexible. Thus, we can understand why encouraging teachers to change their beliefs is a daunting task.

Notwithstanding their reported inflexibility, beliefs can be changed by CPD and developing knowledge of technology. As Ertmer (2005) suggested teachers who had limited understanding and experiences on how to integrate technology would go back to their previous experiences while attempting to implement ICT. In a study of Saudi Arabian teachers, Al Gamdi (2015) was interested to find out how ICT CPD influenced the attitudes, behaviour and knowledge of teachers towards the use of ICT in their teaching. He found that ICT CPD had a mixed impact where not all the trained teachers used tools and applications that had been presented in the training sessions. However, he also found that there were some contextual barriers to ICT use as class size, support, access, class time and facilities.

Al Gamdi (2015) and Law (2008) point out that teachers are able to enact change if they have developed their competencies. Chen (2008) suggested that teachers should be involved in 'effective' ICT CPD in order to address misunderstanding, lack of knowledge or unconscious conflict beliefs. Moreover, teachers should be asked to reconsider their pedagogical beliefs in order to be able to integrate ICT into their instruction in an innovative way. To sum up, Chen (2008) argued that teachers' level of knowledge, their beliefs and contextual factors probably interact with each other. Thus, Chen proposed that researchers should take into consideration teachers' beliefs together with contextual factors and effective ICT CPD when promoting innovations in schools.

A lack of consensus between researchers in regard to the relation between teachers' pedagogical beliefs and their ICT practice, continues. In one of the most recent studies,

Tondeur, van Braak, Ertmer, & Ottenbreit-Leftwich (2017) synthesised qualitative findings from 14 studies from different countries and reported a "bi-directional'' relationship between teachers' beliefs and educational technology use, in which ICT integration within educational processes are able to alter the beliefs of the teachers towards more constructivist beliefs and a student-centered approach. They claimed that the process of learning to teach with ICT is an iterative one. Secondly, they noticed that teachers' pedagogical beliefs could hinder ICT integration. Therefore, they suggested that it is important to understand the interrelated factors including examination requirements, a huge schedule and the lack of time, which they found had significant influence on teacher beliefs, ICT use and desired outcomes. In other words, they highlighted that an examination-oriented society and overloaded schedule tended to lead teachers to use ICT in teacher-centered approaches. Thirdly, they found that the connection between teacher-centered beliefs and more student-centered educational beliefs is not a "bi-polar distinction", but they believed that it is rather a multi-dimensional one where the process of ICT integration is individualized and differed from one teacher to another. Fourthly, pedagogical beliefs were relatively stable and thus they suggested that teachers needed to be provided with long-term professional development in order to change their pedagogical beliefs and practices. Finally, pedagogical beliefs and technology use was influenced by the school context. Therefore, they suggested that it was important to build a coherent and supportive school community of practice in which included sharing a vision with all the stakeholders in order to integrates ICT meaningfully.

Ertmer (2005) suggested three different strategies that have the potential to bring about changes in teachers' beliefs toward employing technology in teaching and learning. Based on Ertmer's argument they can be summarised as:

1. Personal experience: because beliefs are highly personal in nature, it is difficult to be influenced by persuasion (Nespor, 1987). Ertmer (2005) argued that it is not necessary to change teachers' beliefs in advance of introducing them to technological applications; teachers need to be presented with hands-on experiences which may lead eventually to belief changes.
2. Vicarious experience: This is based on the notion that teachers observe their colleagues implementing ICT in classroom. In this case observing classroom behaviour can increase the observers' confidence and promote the same actions as carried out by the role model.
3. Social-cultural influences: This assumes that teachers' practices and beliefs are influenced by opinions that are expressed around them. Hence, involving teachers with professional communities that encourage the use of new methods will help them to be more likely to effect change in their practices.

Perhaps one way of addressing change is, as Schunk (2000) suggests, promoting small instructional steps, such as using email addresses with parents, before attempting the larger change. Schunk believed that this would build teachers' confidence toward using new practices. Lee & Son (2006) pointed out also that confidence is, not surprisingly, gained from experience and increased by practice. This means that if teachers use ICT tools for teaching and learning experiences, their confidence in using computers might be higher. Hence, the well-respected writer on teacher development, Guskey (1986) pointed out that teachers' confidence should be enhanced at the early stage in order to achieve successful change in teachers' practices and beliefs. Thus the level of teachers' confidence in employing computers has a significant impact on the successful ICT integration in the

classrooms (Alshmrany et al., 2014). As Henderson (2014) indicated, teachers with a low level of confidence had avoided using computers in their classroom mainly because of their fears of being embarrassed in front of their learners and colleagues; with use of technology over a long period of time, confidence should improve.

Table 3-1 summarizes the teacher dimension. We can see that some of the big issues concern teachers' pedagogical beliefs, whether teachers can be changed and what needs to be in place to help teachers to change. These leave two questions. Do beliefs make much difference? Can teachers be supported effectively to use ICT ?

Table 3-1 Enablers and obstacles for the teacher's dimension.

Enablers	Obstacles
• Teachers with constructivist learning belief (e.g. Hsu, 2016; Ertmer & Glazewski, 2015; Mama & Hennessy, 2013;) • Teachers with high self efficiency beliefs and their capacity to use ICT (e.g. Hsu, 2016; Fathema et al., 2015; Lee & Tsai, 2010) • Teachers have some room in their curriculum and flexibility in employing assessment methods (e.g. Chen, 2008; Hsu, 2016; Becker, 2000; Khouj, 2011) • The integration of ICT within the educational process (e.g. Tondeur et al., 2017) • Teachers have convenient access to ICT tools (e.g. Hsu, 2016; Becker, 2000) • Teachers with positive beliefs about the value of using ICT (e.g. Hsu, 2016; Buquoi et al., 2013) • Providing teachers with technical support (e.g. De smet et al., 2012) • Providing teachers with long term of effective ICT CPD (e.g. Tondeur et al., 2017) • Availability of support from parents, colleagues, administrators (e.g. Chen, 2008; Judson, 2006) • Providing teachers with time (e.g. Al Gamdi, 2015; Chen, 2008; Tondeur et al., 2017) • Involving teachers in professional and coherent community (e.g. Ertmer, 2005; Fullan, 1993,Tondeur et al., 2017) • A shared vision between all stakeholders (e.g. Tondeur et al., 2017) • Providing teachers with hands on experiences (e.g. Ertmer 2005) • Providing teachers the chance to observe other teachers using ICT in teaching (e.g. Ertmer 2005)	• Teachers with teacher-centered belief (e.g. Hermans et al., 2008; Hsu, 2016) • Teachers with low self-efficiency beliefs toward their capacity to use ICT (e.g. Fathema et al., 2015; Al shmrany et al., 2014) • Teachers are restricted with pen pen-and pencil assessment and follow inappropriate curriculum (e.g. Khouj, 2011; Chen, 2008) • Lack of ICT infrastructure (e.g. Hsu, 2016; Becker, 2000) • Lack of teachers' knowledge and understanding about ICT (e.g. Ertmer, 2005; Chen, 2008) • Teachers with negative beliefs about the value of using ICT (e.g. Hsu, 2016; Buquoi et al., 2013) • lack of technical support (e.g. De smet et al., 2012) • Lack of sustainable ICT CPD (e.g. Tondeur et al., 2017) • Teachers with lack of time, large number of learners and lack of supportive community and overloaded schedule (e.g. Chen, 2008; Tondeur et al., 2017; Ageel, 20011)

3.3 Factors at school level

Through the use of a meta-aggregative approach to analyse the results of 14 selected studies, Tondeur et al. (2017) found that school context has a key role in supporting changes in teachers' pedagogical beliefs and their ICT use in these schools. In other words, they explained that the schools that are characterized by policy planning, peer support and technology support have a huge influence on the success of the teachers' practices and ICT use. Tondeur et al. (2009) had conducted a previous study in primary schools in Flanders in order to investigate teachers' use of technologies in the classroom and found too that organizational factors played a significant role in integrating ICT in teaching and learning.

There are two main issues concern the organizational aspect, namely: ICT infrastructure and ICT leadership. Since this research is concerned with ICT integration in the teaching and learning, these issues will be discussed in more detail in the following sections.

3.3.1 ICT infrastructure

Rosen (2011) pointed out that to provide 21st century education and skills, there needs to be the availability of resources in classroom teaching and the integration of web-based technology. Many studies such as Albirini (2006), Gil et al. (2017) and Christensen & Knezek (2008) show that proper ICT infrastructure in schools acts as an essential initial stage for ICT integration in schools. Therefore, the lack of access to ICT tools hinders the integration of ICT into teaching and learning (Lawrence & Tar, 2018). In other words, the schools need to be provided with good internet connections and computing devices for both the teacher and the learners to use in the classroom in order to build such a learning environment (Lisa, 2011). Garba et al. (2015) further assured us that the very basic level of

ICT integration in the classroom starts with the use of a computer and overhead projector. The availability of a computer and overhead projector in the classroom for the teachers to use is an important factor that affects ICT integration in the teaching process. Oldknow (2009) believed that such presentation will offer the learners the opportunity to learn in a more meaningful way and see the relevance of what they are learning to real life situations. Ljubojevic et al. (2014) added that with the use of such devices during their lessons, they can bring real life situations to the learners in the classroom by projecting relevant images, animated short-stories and video clips. Hammond and Manfra (2009) believed the teachers use relevant videos, pictures and documentaries in their presentation helps to make learning easier and more concrete for the learners. Serow & Callingham (2008) further pointed out that the use of Power Point presentation and smart board devices in the teaching-learning process has the potential power to help the teachers to deliver subject content in classroom instructions.

Garba et al.(2015) see that the availability of these two tools in every classroom is important and considered a necessity for integrating ICT into pedagogical practices. They explained that the lack of these critical tools in the classroom will make teachers remain using traditional teaching methods. However, Ale & Chib (2011) pointed out that the level of progress to create a 21st century environment differs from one country to another as does commitment to provide such resources. Although ICT infrastructure is considered a prerequisite condition, Gil (2017) asserted that it is not a sufficient condition for the integration of ICT into the classroom.

Many issues related to ICT tools could prevent teachers from exploiting the availability of these devices at the school. Hammond et al.(2009) asserted that a shortage of computers and of policies and practices associated with access prevented teachers from using

technology in their classrooms. Fragkouli (2006) too noted in Greek schools that the positioning of computers only in computer labs was one of the main reasons for teachers to avoid using ICT regularly in their classrooms. In the same vein, in Malaysian smart schools Hamzah, Ismail & Embi (2009) found that teachers were faced not only with a shortage of computers in classrooms but were required to book computers in advance in order to able to use them. Some of the computers were considered too old and slow, illustrating that it is not only the number of computers that matter but their functionality. Selwood & Tang (2007) investigated Taiwanese teachers' perspectives toward ICT use and found that the majority of teachers stated the quality and age of hardware influenced them. The distribution of ICT devices in schools also plays a significant role in integrating ICT into teaching and learning. Tearle (2004) felt that the convenient location of ICT hardware was a very important factor at the school level. Access was a key barrier to the take-up of ICT and as suggested by Mumtaz (2000) could also seriously limit "what teachers are able to do with ICT" (p.336). To sum up, integrating ICT in the schools requires the availability of sufficient number of computing facilities at school, easy availability to teaching/learning resources via 'the school's Internet' during or outside school time, suitable software applications and policies to facilitate access (Anderson & Unesco, 2002). ICT infrastructure difficulties can frustrate teachers, limit their abilities to deal with ICT and eventually lead to resistance of using ICT in their teaching practices (Mumtaz, 2000).

Schools vary in respect to access in important aspects. Way & Webb (2007) identified four different levels of technological infrastructure in school:

- A disconnected environment characterised by very few computers; no internet access and "standalone" workstations.

- An initially connected environment characterised by a small number of computers that are linked to broadband access but are linked only to a small number of computers that are allocated in particular places, with low speed and restricted bandwidth.
- An established connected environment characterised by the provision of computers and multimedia devices such as projectors and digital camera in various places at school.
- A multifaceted connected environment level having ICT as an integral part of their school environment in which they have, in addition to the availability of high speed internet that are provided to all school computer and provision of multimedia devices, an official website and email address as a critical part of school that is used regularly between teachers and their learners. This pattern seems routine for many European schools. However, it still has relevance for Saudi Arabia schools.

Way and Webb (2007) found that there was a strong relationship between a high level of technological infrastructure and a shift towards a transformative pedagogical approach, characterized by changes in organisation and structures of schools, teachers' and learners' roles and the professionalism of teachers.

Passey (2010), in addition, evaluated the implementation of an LP development in Wolverhampton schools and found that good quality ICT infrastructure affected school use of ICT positively. Passey concluded that ICT infrastructure must be included in the procurement planning for the implementation of a portal into school practices.

Summarizing the access dimension factors in Table 3-2, we can see that schools need to have good internet connection, provision of computers for teachers and learners to use, good distribution of computing devices that are functional, overhead projector in each classroom.

Table 3-2 Enablers and obstacles for the access dimension.

Enablers	Obstacles
• Providing schools with functional and appropriate software and hardware (e.g. Christensen & Knezek, 2008; Passey, 2010) • Providing each classroom with a computer and overhead projector (Garba et al., 2015; Ljubojevic et al., 2014; Oldknow, 2009) • Good distribution of ICT devices in school(Eg Tearle 2004; Selwood and Tang, 2007) • Providing schools with sufficient number of computing facilitates (Eg Anderson and Unesco, 2002) • High speed internet access (e.g. Lisa, 2011; Anderson and Unesco 2002)	• Shortage of computers and policies at the schools (e.g. Hammond, 2009) • Low quality and functionality of ICT devices in schools (e.g. Hamzah et al., 2009) • Lack of computers and overhead projectors in the classroom (e.g. Garba et al., 2015) • Providing computers only in computer labs (Fragkouli, 2006)

3.3.2 **Leadership**

There is general consensus among many researchers (Boulton & Hramiak, 2014; Grainger & Tolhurst, 2005; Hayes, 2007; McGarr & Kearney, 2009; Vanderlinde, Aesaert, & Van Braak, 2014) about the key role of school leaders and their positive impact on ICT integration in schools. Al-Ruz & Khasawneh (2011), for instance, found that leadership was one of the most significant aspects that had a direct effect on ICT adoption in Jordan. Binothman (2015) agreed that leadership had a significant role in achieving successful ICT implementation. Along the same lines, Grainger & Tolhurst (2005) focused on exploring what organizational factors influenced teachers' use and perception of ICT and the use of LMS. They found that the characteristics and perceptions of leadership was one of the major factors that affected LMS use. Ofsted (2009) found some examples of schools that

had a good use of VLEs, attributing it to the headteachers who promoted a whole school approach to integrate VLEs. According to the school improvement literature, leadership is an important factor in educational change and development in a school (Stoll, 1999).

In terms of effective headteachers, (Li & Wong, 2006; Sheppard, 2003; Vanderlinde et al., 2014) all supported Tearle's (2003) conclusion that sharing leadership positions was important for the kind of cooperative culture which has a powerful impact on allowing schools to maintain growth in ICT development. Vanderlinde et al. (2014) added that ICT use should be situated in a professional school culture, characterized by having a headteacher who shares a vision on the place of ICT in teaching and learning and leads a school-based ICT policy plan. Baylor & Ritchie (2002), Hadjithoma & Karagiorgi (2009) and Hayes (2007) found that school leaders are in an optimal situation to provide the conditions for creating a common perspective and approach on ICT, and that they can foster and assist ICT integration. Further, the idea 'ICT is for all', if promoted sufficiently by the leadership, will inspire teachers, pupils and parents to become part of 'ICT culture' literacy (Selwyn & Bullon, 2000). Harris (1999) added that teachers' behaviour towards the utilization of ICT was profoundly influenced by the favourable perspectives of school leaders. Schiller (2003), who also investigated the elementary school leaders, believed that headteachers were central to coordinating the instructional transformation for ICT. He concluded that headteachers who adopted a strongly positive attitude to innovation could promote a culture that has better gains for their students and staff. Dexter (2008) also agreed that that the learning environment created by school leaders helped to develop TPACK competencies of teachers. According to McLaughlin & Talbert (2001), such an environment could be considered as a way to organize a teacher's professional learning.

Headteachers vary in their styles of leadership (Ghamrawi, 2013). Goleman (2004) investigated the relationship between emotional intelligence and effective performance in leaders in terms of the ways that a headteacher controls the work progress, deals with human resources, and the extent to which they permit others to contribute to decision-making and problem solving. Ghamrawi (2013) identified three common styles of leadership. In the 'democrative' style of leadership, the headteacher encourages all school members to be involved in decision making and the final decision is taken after a general agreement from all school members. The heads who follow an 'autocratic directive' leadership style, on the other hands, set the decisions by themselves and force it on the school's staff and students. In addition, they have full control and power over their teachers and all school aspects. However, the 'delegative/nondirective' style, which is the third type of leadership, allows teachers to set the tasks or visions together with their colleagues. Although there are many other types that have been mentioned in the literature such as 'authoritative,' 'laissez-faire,' 'affiliative,' 'coaching,' 'coercive,' 'commanding,' 'visionary,' 'pace-setting' leadership styles. etc., Ghamrawi maintains that all these types fit into the three main categories in one way or another. Ghamrawi (2013) explored the leadership style of Lebanese public school principals and found that the autocratic leadership style has a negative impact on attitudes towards ICT use in teaching and learning. Ghamrawi also found that leaders' behaviour influenced the motivation of teachers, which itself hindered ICT integration in teaching and learning. Similarly, Hadjithoma & Karagiorgi (2009) carried out research in four primary schools in Cyprus with a high use of ICT and found that the role of school heads and their leadership style was the main factor concerning the integration of ICT into schools. Ghamrawi (2013) proposed elements that need to be part of training initiatives of public school principals in Lebanon, including distributed leadership and shared decision making.

There are some specific characteristics of leadership that play a key role in ICT integration. Chen and Selwood (2009) highlighted that the differences between the schools were not as a result of strong leadership of a school but because of an ethos of collaborative leadership among the school members. They agreed with Sheppard's (2003) study and concluded that the role and style of leadership in school was essential to success in using ICT in schools. Likewise, Passey (2010) investigated the effective use of learning platforms in schools and found that the presence of a positive, enthusiastic and coordinated strategic approach by the school head was one of the conditions for successful integration. Jacobson, Day and Leithwood (2005) investigated the characteristics of helpful school administration in seven different countries and discovered three shared foundations for successful leadership practices: 'setting directions' which involves generating a common perspective, an agreement about school objectives and high performance expectations for staff work; 'developing people' in which a successful leader fosters teachers' individualised and professional assistance, staff commitment, and important values for school development; and 'redesigning the organisation', which involves forming a cooperative learning environment, encouraging staff to participate in decision-making, and formulating the relationships with parents and the wider community. Ng (2008)further investigated the effect of these dimensions of leadership practices on ICT integration and argued that a transformative leadership style was one of the most effective styles for enhancing integration. Similarly, Yuen, Law & Wong (2003) found the transformational leadership style of senior managers in schools was a vital requirement for reformulating organizational matters (perspective, aims and targets). Afshari et al.(2008), who investigated computer use of secondary school heads in Iran, identified the transformational leadership style as having an 'optimal impact' on the integration of ICT in the teaching and learning. According to Burns (1978), who studied the theory of transformational leadership, defined it as " the

transforming leader looks for potential motives in follower, seeks to satisfy higher needs, and engage the full person of the follower" (p.4). Burns meant that in this type of leadership people work with each other and raise their level of motivation to support a common purpose. Burns further found that this type of leadership not only enacts change in the relationship but also benefits the resources of those involved. The school leaders need to function as a trigger of transformation by providing direction, arranging people, encouraging and influencing, and accomplishing transformation (Caldwell, 2007).

Research has studied the correlation between leadership styles and perceived ICT use. However, Gençer & Samur (2016) were interested in examining whether there was a relation between leadership styles and technology leadership competency level and found that there was no correlation between them. Dexter (2007) argued that teachers integrate ICT use in their practice due to technology leadership distributed in the school among the teachers, which reflects the school's characteristics not merely the headteacher's.

Blau and Presser (2013) investigated the use by secondary school heads of LMS and found that successful integration of LMS enables e-leadership of the school leaders and school teachers, where teachers would be able to monitor the pedagogical data, communicate with learners and parents, and delegate the responsibilities. Blau and Presser concluded that e-leadership through LMS changed the whole school culture. They suggested that school heads should expand the use of LMS by involving learners and their parents, monitoring teachers' activitieas within the platform and delegating e-leadership responsibilities. They argued that investing LMS in the school does not assure that teachers and their heads are using it effectively. Therefore, he suggested that LMS was cost effective if data were used to develop teaching and learning practices and to assist and inform decisions.

In writing of the importance of school leaders, Lee, Gaffney and Schiller (2003) and Yee (2001) found that leaders should show managerial skills as well as leadership skills. Thus, they should be adept at organising, arranging and staffing, budgeting, administrating and problem solving, and creating an amount of 'predictability' (Caldwell, 2007). Boulton and Hramiak (2014) add that school heads should be aware of how to minimize the barriers to using new ICT tools and time should be provided for the teachers to develop the use of such tools within their classrooms and to share their experiences of using these new technologies.

Avidov (2018) interviewed 24 'excellent' headteachers, who contributed to enacting change at the school level and were nominated for ICT leadership awards, in on order to find out the conditions and the factors that promoted the sense of empowerment among them. Avidov found an ambition for professional advancement and involvement in technology were preconditions that drove them. In addition to these conditions, Avidov found that there were some internal as well as external factors that created such sense of empowerment. In regard to internal factors, there were emotional and behavioural factors. In regard to the emotional factors, headteachers had a sense of self-efficacy. They believed that they could enact change through the use of ICT and part of that change was to promote self reflection and reflection among teachers. Hence, they could find out what the school needed to do to develop its use of ICT. They had a strong commitment to transform national ICT policy into practice at the school, a high motivation and strong sense of responsibility. These headteachers reported that they encouraged the school's teachers to use ICT and explained the benefits of such use, worked with the teachers to implement ICT within their subjects, reviewed school visions more often, took responsibility to update curricula and assessments mode to be in line with ICT use and shared the role of leadership with other teachers. In respect to the behavioral factor, they

were interested in providing intensive growth and became proactive. The external factors related to ICT national policy and ICT CPD. Avidov (2018) reported that that this type of leadership enacted change at the teacher level and at the school level, so that ICT became a part of the school culture. Avidov then concluded that the combination of such factors together transformed their capability into skills that enable teachers to lead the change at the school level. We can understand that effective leaders need a national ICT plan to support the integration of ICT in the school.

After all, a leader who does not make use of technology is unlikely to raise his or her staff's awareness of its significance (Cafolla and Knee, 1995). Afshari et al.(2010) identified four constructs that contribute greatly to the degree of computer use by principals including a high degree of computer availability, an acute awareness of the qualities of ICT, high level of computer proficiency and a high number of 'transformational leadership behaviours.' To conclude, effective school principals need to show effective leadership, competences toward computer use and access. Training is fundamental if principals are to use ICT adequately in their work (Kirkwood, 2000). Summarizing leadership dimension in Table 3-3, we can see that the school heads have a key role in encouraging a whole school ICT culture and teachers' ICT use. This leaves the question of what kind of leadership seem to support the integration of ICT in schools.

Table 3-3 Enablers and obstacles for the leadership dimension.

Enables	Obstacles
• Headteachers with high competence in ICt use, transformational behaviour, and positive beliefs toward ICT implementation (e.g. Li and Wong 2006: Grainger andTolhurst, 2005; Hayes, 2007; Afshari et al., 2010) • Headteachers with a democratic style of leadership who share role of leadership and decision making (e.g. Ghamrawi, 2013; Li & Wong, 2006; Sheppard, 2003; Vanderlinde et al., 2014) • Headteachers with high sense of sharing knowledge and strong sense of community (e.g. Chen and Selwood 2009; Leithwood, 2005) • Headteachers with an ambition for professional advancement and involvement in technology (e.g. Avidov, 2018) • Headteachers who monitor teachers activities within VLEs and delegate e-leadership responsibilities (e.g. Blau and presser, 2013) • The availibity of ICT national policy and ICT CPD for the leaders (e.g. Avidov, 2018) • The active involvement of the heads with their teachers. • Having school heads who share a vision on the place of ICT in teaching and learning and set a school-based ICT policy plan (e.g. Vanderlinde et al., 2014) • Expanding the use of ICT by involving students and their parents (e.g. Avidov, 2018, Selwyn & Bullon, 2000) • Schoolheads with high sense of self-efficacy, self reflection and reflection of teachers work at the school; strong commitment to transform ICT national policy in to real practice at the school, high motivation and strong sense of responsibility (e.g. Avidov, 2018) • The provision of ICT infrastructure at the school (e.g. Afshari et al., 2010)	• Paasive role of the school head • Autocratic-direvtive style of leadership(e.g. Ghamrawi, 2013) • Shool heads with negative belifs about ICT use and less enthusiastic (e.g. Passey, 2010) • Lack of ICT CPD for school heads (e.g. Kirkwood, 2000; Avidov, 2018) • Lack of ICT skills for school heads (e.g.Afshari e. al., 2010) • Lack of ICT national policy (e.g. Avidov, 2018) • Limiting ICT use for teachers but not for the students to use (e.g. Avidov, 2018, Selwyn & Bullon, 2000) • Lack of shared ICT policy at the school(e.g. Vanderlinde et al., 2014) • Lack of computers and access at the school (e.g.Afshari et al., 2010) • Lack of an ambition for professional advancement and involvement in technology (e.g. Avidov, 2018) • Lack of self-efficacy, self reflection and reflection of teachers work at the school; lack of commitment to transform ICT national policy in to real practice at the school, lack of motivation and lack sense of responsibility (e.g. Avidov, 2018)

3.4 Factors beyond school level

There are three main issues found beyond the school level: parents' participation, culture and policies. These will be discussed in more detail in the following sections.

3.4.1 Parents' participation

According to Jewitt et al.(2010), who investigated the use of e-learning in 12 UK schools, successful integration of ICT does not only require changes in the technological, pedagogical and organizational contexts, but needs to address out-of-school learning.

Portal use is not limited to school hours. Learners need to be able access the educational portal at home and parents should be encouraged to involve themselves in supporting their children where possible. Selwyn et al.(2011) argued that schools should allow parents to be involved in all aspects of their children's schooling through the use of the school's LP. Gillespie, Boulton, Hramiak, and Williamson (2007) argued that to enable personalized learning effectively through ICT, there is a need for a planned whole-school approach and engagement with parents and learners.

Selwyn et al. (2011) investigated how schools were using LPs to engage parents in their children's learning in six secondary school in England. They found that LPs were used by all the schools as an additional tool to deliver information, such as providing parents with a detailed report on a learner, but not to invite communicate from parents. Selwyn and his colleagues found that communication was one way and top-down, which put parents act in a passive role. They concluded that a LP allowed the schools and the teachers to provide visible and formal demonstration of their expertise to parents, and so to increase parental trust in the school to do its job, and it promoted existing routines without leading to new or different forms of parental engagment. In other words, they highlighted that the use of LP systems "are unlikely to drive any changes in parental involvement unless accompanied by wider shifts in the 'parent-centeredness' of a school's organizational culture" (p.323).

Blau and Hameiri (2012) investigated the impact of the interactivity of teachers within a LMS by looking at the system activity logs of learners and their parents. They found that both learners and parents logged on more when learners were taught by teachers who used the system frequently, compared to those whose teachers used the system infrequently. We can understand that high use teachers could enhance parents' involvement.

The acceptance of parents to allow their children to use LP is another highlighted issue found in the literature. Ledbetter and Finn (2013) pointed out that the willingness of the parents to communicate beyond school boundaries developed teachers' attitudes towards ICT use and promoted students' learning. Many studies have shown that parents can encourage or hinder their children from using ICT and there were variations in the location and the availability of the computers at home, the rules that had been set about access and the value placed on the technology (Kerawalla and Crook, 2002). Thrupp (2008) point out that householders differ – some parents may help their children using the computer and see it as a work tool, while others might restrict activity in the belief that overuse may be harmful or worry that there was a risk of the computer being damaged (Hargittai and Hinnant, 2008). Thus, we can understand that not all the learners will have the same opportunities to use ICT at home.

Students who are provided with opportunities at their homes tend to be more skilled in ICT. This can be seen in many studies such as Vekiri (2010), who used a self-reporting questionnaire of learners in Greece. Other studies show how parents could deter pupils from using ICT. Brown-Yoder (2001), for example, argued that lack of technological skills might be due to their parents not being convinced about ICT as valuable in schools or not viewing it as an integral part of the educational process. Qablan, Abuloum, and Al-Ruz (2009) conducted a study in Jordan and found that only a few learners had computers and access at their home. This was due to parents' understanding and views about ICT. Nasser's et al. (2011) also found that parents' rejection of the internet at home was one of the obstacles that faced Qatari learners while using a LMS. This refusal was caused by their lack of trust in the internet content and their little knowledge and understanding about the parental controls on web browsers (Nasser et al., 2011).

Through reviewing some Arab studies, we can see that lack of opportunities for children at home are not only related to the inability of parents to buy technological tools but also connected to lack of acceptance and understanding about such devices in their homes. As Romanowski and Nasser (2010) indicated, Muslim societies more often have restrictions towards media and Internet access and thus learners' ICT knowledge and skills could be developed only if they received encouragement from their parents. However, a recent study conducted by Binothman (2015) showed that Saudi parents encouraged their pupils to use an educational portal and both teachers and learners reported that there was no parent refusal to allow children to use the system.

Passey (2010) found that some English schools had encouraged parental involvement by running ICT classes for learners' parents after school in order to train them in basic ICT skills. It was believed that once parents received these skills and knew what was involved in school's portal content they would be better enabled to help their children use it. Thus, schools which already had a history of parental engagement were the most effective in using LPs. Some effective school worked with learners' families to reach agreed sets of protocols and policies regarding acceptable use, parental consent for filming and recording of in-class group activities, and issues related to data protection and anonymity of data. Summarizing parents' participation dimension, Table 3-4, we can see that parents have a key role in encouraging their children to use LPs.

Table 3-4 Enablers and obstacles for the parent's participation dimension

Enablers	Obstacles
• Parents have Positive beliefs about ICT use generally and particularly in schools (e.g. Jewitt et al., 2010; Vekiri, 2010) • Providing ICT classes for parents (e.g. Passey, 2010). • Teachers high activity use of LP with parents and learners (e.g. Blau and Hameiri, 2012) • School set clear guideline with parents about most appropriate use of application (e.g. Passey 2010) • Availability of hardware and internet access at home (e.g. Qablan et al., 2009) • Parents with high ICT skills (e.g. Nasser et al., 2011) • Parent accept to communicate beyond school boundaries (e.g. Ledbetter and Finn, 2013)	• Parent negative attitudes about ICT use in education (Eg Brown-Yoder 2001; Nasser et al. 2011) • Lack of internet access, hardware at home (e.g. Qablan et al 2009) • Lack of parents understanding and acceptance toward ICT (e.g. Romanowski & Nasser, 2010) • Teachers with less activity use of LP with parents and learners (e.g. Blau and Hameiri, 2012) • Lack of parents' technical skills (e.g. Nasser et al., 2011) • Lack of relationship between school and students' parents (e.g. Passey 2010) • Parent reject to communicate beyond school boundaries (e.g. Ledbetter and Finn, 2013)

3.4.2 **Culture**

Although Internet diffusion has occurred on a global scale, there are significant differences between countries in terms of how far and how fast this has happened. A growing number of scholars (see Bagchi, Cerveny, Hart, and Peterson, 2003; Lee, Chung, and Jung, 2015; Lee, Trimi, and Kim, 2013; Maitland and Bauer, 2001; Sánchez, Martínez, and Martín, 2009; Sánchez-Franco, Martínez-López, and Martín-Velicia, 2009) have investigated the relationship between national culture and the adoption of ICT. They have consistently found variation in Internet diffusion, IT implementation and its acceptance could be attributed to national culture. Sánchez et al.(2009), for instance, were interested in the effect of the national culture, particularly in terms of individualism and uncertainty avoidance, on the acceptance and usage of web-based electronic learning for European educators from diverse cultures. They found that the culture differences had an influence on educators' attitudes and behaviours toward using Web-based applications. Lee et al. (2013) found that culture differences could hinder ICT transformation.

Albirini (2006) also investigated the influence of culture and argued that teachers' cultural perceptions should be taken into consideration, particularly in developing countries. Along the same lines, (Martinez, 1999) agreed that developing countries usually faced challenges in ICT implementation as technology was not an important part of their people's culture. Albirini (2006) argued that failures in ICT promotion in Syria were caused by a rush to implement ICT in schools without understanding teachers' cultural perceptions towards these new tools. Albirini concluded that force-fitting the culture to the technology could bring an unfavourable environment for ICT implementation. In a further field study conducted in various different Arab countries, Hill et al., (2008) found that social and cultural factors were obstacles for developing countries when transferring western technology into practice.

Many scholars have used Hofstede's cultural framework (Erumban and De Jong, 2006) as a means of explaining the differences in ICT adoption rates across countries and have agreed that national culture does influence the ICT adoption rate of a country. They further felt that Power Distance and Uncertainty Avoidance dimensions were the most significant cultural factors that can explain some of the differences in ICT adoption rates between countries. Kovačić (2005) analysed the influence of national culture on eGovernment readiness and its components for 95 countries and examined the impact of national cultural dimensions, finding that national cultural indicators had a moderate impact. In regard to cultural variables, Kovačić found that Individualism and Power Distance were the only significant variables that would explain differences in levels. To conclude, both studies agreed that Power Distance has a significant role in ICT adoption. In a Saudi context, Karim and Rampersad (2017) is one recent study examined factors that effect on the adoption of cloud computing in Saudi universities and found that large Power distance and

High uncertainty avoidance had a negative influence of the adoption of such tool. However, there was no consensus about other cultural dimensions.

In regard to VLEs, Boulton (2014) compared the usage of UK students with part-time Hong Kong students on a UK university course delivered in Hong Kong. She found that Hong Kong students were initially less engaged with the use of VLEs before conducting the research. However, Boulton found that this disengagement was not because the rejection to use of VLEs itself, but rather because of a lack of an induction to show them how to use the programme and bias in the design of course materials. Once these issues were considered, Boulton found an increased access to the programme.

Summarizing cultural dimension effects in Table 3-5, we can see that the local culture could affect the integration of ICT. This leaves the question: is Saudi Arabia a special case?

Table 3-5 Enablers and obstacles of the cultural dimension

Enablers	Obstacles
• Small Power Distance (e.g. Kovacic, 2005) • Low in Uncertainty and Avoidance (e.g Woodrow et al., 1993; Hofstede, 1980) • Individualism (e.g. Kovacic, 2005; Hofstede, 1980) • Long-term orientation (e.g. Hofstede, 1980; Erumban & De Jong, 2006) • Designing a VLEs that aligned with students' needs (e.g. Boulton, 2014) • Providing workshops in how to use VLEs (e.g. Boulton, 2014)	• large Power Distance (e.g. Karim & Rampersad, 2017, Lee & Peterson, 2001) • High in Uncertainty and Avoidance (e.g. Karim & Rampersad, 2017) • Collectivism, Short-term orientation (Hofstede 1980).

3.4.3 **Policy**

Policy plays a significant role in the implementation of ICT in educational practice; it can facilitate or hamper ICT implementation. Furthermore, it can provide direction and guidance for practitioners. Pettersson (2018) reviewed international research from 2007 to 2017 in order to find out how the pedagogical aspects of digital competence in educational

contexts were addresed in relation to policy, strategic leadership, teachers and their practices in the classroom, and organizational infrastructures. In regard to the policy, he suggested that there is a need to formulate goals and vision 'in policy-related document[s]' at school, regional and national level. Pettersson further expalined that schools would then be able to transform these policies into real activities at the institiusioal level. Avidov (2018) found that ICT national policy created an environment that encouraged schools to integrate ICT successfully.

In regard to the Saudi context, Albugami and Ahmed (2015) attempted to find out the factors that stopped Saudi Secondary schools from implementing ICT successfully. They found that people at the schools perceived ICT as a significant tool in promoting learning outcomes, but there were some challenges faced by the schools, one of which was ICT policies. Albugami and Ahmed argued that there was a lack of clarity in Saudi educational policy, which emphasized the benefits for schools to use ICT without offering ICT CPD or providing good infrastucture and an adequate number of ICT tools at the schools. They further suggested that there was a neeed to set clear ICT policy to help school heads and teachers understand what they should apply within their schools.

Two key issues have been noticed by researchers. First digital equity. Secondly, there is a set of necessary conditions that needs to be in place at a policy level for ICT implementation (Voogt et al., 2013). In respect to the first, access to technology is not the only aspect of digital equity (Voogt et al., 2013). Resta and Laferrière (2008) suggested five dimensions that should be involved: (1) having access to hardware, software and connection to the internet; (2) having access to content in a local language that is meaningful and culturally relevant; (3) having access to share and create digital content; (4) having access to educators who have knowledge in how to use digital resources; and (5)

having access to a range of research on the application of the digital technologies that is characterized by high quality in order to promote learning.

Kozma (2008) and Taylor (2008) identified essential elements of strategic and operational policies. They presented a framework for ICT policy that could be used by policymakers and researchers to compare, analyse or revise their national educational system. In this framework, Kozma differentiates between strategic policies and operational ones; strategic ICT policy refers to a set of visions and goals which shows how ICT should be introduced and integrated in to the educational system. It also provides guidance for teachers, learners and also parents about the benefits that can be achieved through using ICT in schools. Operational ICT policies are focused more on programmes and provide resources that enable these programmes to be carried out. Kozma argued that most national policies become techno-centric, and focused on operational issues, in that they concern the purchase of technological tools or encourage teacher training without being aware of the importance of providing clear and strong pedagogical goals. In brief, Kozma argued that strategic ICT policies provide a vision of future but operational policies make the visions realized. Hence, a combined approach is needed (Kozma, 2008).

Strategic ICT policies were divided by Kosma into four different rationales, including Support of Economic Growth, Promoting Social Development, Advancing Education Reform and Supporting Education Management. Kosma (2008) points out that countries may differ from each other in terms of rationale. Some set out their ICT policies as supporting economic growth or social development. Chile, for instance, is one of the less developed countries which strived to integrate ICT policy in order to address the social inequities in the country following on from military rule. Others promote ICT to reform their educational system or to support their educational management. ICT policy that

strives to reform educational systems tend to seek to prepare learners to acquire twenty-first century skills such as collaboration, creativity, communication This envisages a changed pedagogical role of the teachers will be changed (Blumenfeld, Kempler, and Krajcik, 2006). Australia is one of the examples that used ICT policies to reform their national educational system in that policy sought to promote constructivist learning in their schools, personalized, collaborative, interactive learning and new assessment approaches (Student Learning and Support Services Taskforce of the Ministerial Council on Education and Employment, 2006). The USA evoked ICT policy in order to develop management efficiencies and accountability of their schools and often used technology to deliver online content and assessments in order to provide all of the stakeholders (which include teachers, principals and parents) with performance and attendance data (Paige, Hickok, and Patrick, 2004). Kozma (2008) further points out that countries could combine two or more rationales together. For example, Singapore, promoted ICT with an economic rationale together with a focus on education reform.

Operational ICT policy has been classified by Kozma (2008) and Resta and Laferrière (2008) under five different components: infrastructure development; teacher training; technical support; pedagogical and curricular change; and finally content development. Firstly, infrastructure development concerns the provision and budget allocation needed; for example, policy should assist schools to obtain a minimum acceptable infrastructure. Secondly, teacher professional development needs to be addressed at the early stage of ICT introduction, where teachers need not only to be trained in how to operate hardware and software but also in how to integrate it in their classroom practices. Voogt et al. (2013) agreed that having basic and limited ICT literacy skills for teachers is not sufficient. Technical support is the third element and this is needed in order to ensure that infrastructure is kept up to a particular standard and teachers adequately supported.

Fourthly, curriculum needs to be broader than core skills in order to provide much more focus on thinking skills, information skills and creativity; assessment methods should be revised to measure learners' skills in analysing and communicating. Resta and Laferrière (2008) also stated that policy frameworks must align changes that are needed in curriculum, pedagogy, and assessment. Finally, digital content needs to be developed in local language or reflecting local culture. Such developed content should be also available and accessible for teaching and learning. Some countries may need to establish their own digital content and make it part of their operational policy in order to maintain their special consideration of their cultures and language (Kozma, 2008; Resta and Laferrière, 2008).

As well as noting the importance of the presence of both of the strategic and operational components in any ICT policy, it is also important to know to what extent these ICT policies are applied and the problems faced in doing so in different countries. Moonen (2008), for instance, compared between European regions and less developed countries and found that there were differences among them. He noticed that the former countries had shifted their ICT policy from being explicit and visible to more implicit and incorporated within the wider policy context. The situation is different in other regions, where the main focus of less developed regions is still on implementing technological infrastructure and teacher training issues. This distinction is due to the economic circumstances and the lack of convincing evidence about the influence of ICT policies on the daily teaching practices for most less developed countries (Moonen, 2008).

Although, developed countries have a high focus on the IT implementation, they have tended to experience disappointing results with respect to the pedagogical renewal of the educational system as a whole. Moonen pointed out that a logical sequence was needed in any ICT policy: with policy being followed by hardware and software provision and

technical IT and communication infrastructure. Once the first stage is established, policy should focus explicitly on the pedagogical factors. Moonen argued that most European countries need to address what is described by Kozma (2008) as operational components of ICT policies. Hence, Moonen suggested that policy makers of developing countries have to keep focusing on providing a sufficient technological infrastructure and be less aware of the pedagogical/instructional and transformation approach. In another words, they should be concerned about the introduction of IT in education until their technical access problems are reasonably well solved. Moreover, policy makers need to wait for a new balance to occur between informal and formal learning, based upon continuing technological developments, before expecting a transformation in learning that makes use of the opportunities of IT to occur.

Moonen supports his suggestions with the idea that all young learners around the world use applications such as YouTube very effectively without being given any formal policy or pedagogical/instructional approach. Informal learning supported by technology policy and peer contact is 'doing the job'. Diffusion and user-friendly availability of IT are enough to make take up happen. Voogt et al. (2013) believed that it is not necessarily to pay special attention to ICT in the curriculum as a tool or as an object for learning. Hence, there is a need for policy makers and school heads to work together to develop policies and actions on the informal learning environments for formal learning settings. However, no consensus has arisen among researchers about that notion that there is an identifiable generation, or even a single type, of highly adept technology user. In another words, not all the young learners are skilful in the technology use. Bennett and Maton (2010), for instance, were concerned about claims that have been made toward young learners and their technology experiences and argued that there are different views about young peoples' use of technology, ranging from expressions of concern about lack of socialisation and

poor interaction skills, internet addiction and cyberbullying (e.g., Cross et al, 2009), to idealisations of a new generation of highly motivated, highly technologized learners. Young learners are differentiated though, as Bennett and Maton (2010) found from reviewing studies that young learners frequently use some technology based activities more than others. For example, accessing information and communicating through the internet are much more common than creating text, graphics, audio and video. Through interview data, Kennedy et al. (2009) noticed also that majority of young learners were not sure about the use of some web 2.0 tools, such as blogs and wiki. Thus, Kennedy argued that learners might not be as skilled in using technology as expected, particularly with advanced activities. Jenkins (2004) also points out that everyday technology based activities might not be beneficial to prepare learners for academic practices.

Moonen (2008) suggests three main policy lines. Firstly, schools should provide basic knowledge and skills about IT and support its use in the daily school practice. Secondly, policy should support the creation and facilitation of informal teacher networks. Hence, teachers (young and old) should be or become 'equals' with their pupils in their attitudes towards IT. Thirdly, policy should facilitate the use of IT by providing internet access as much as possible, not only in schools but in many kinds of public institutions such as libraries, sport facilities, and homes. Moonen further argued that such a policy can only succeed if the necessary technological infrastructure is available and affordable.

Alshmrany et al. (2014) investigated the use of ICT in Saudi schools and argued that Saudi Arabia was unable to take full advantage of ICT in teaching. They found the Saudi government had tried to transform their educational system and provide hardware and software to schools to fast track ICT usage in the educational system, but ICT resources supplied often lacked internet access and were not used appropriately. Hence, Alshmrany

et al. proposed that the Saudi government and the Ministry of Education should take action based on realistic targets and planning. They further argued that the government should be made aware of the global trends for using IT in day-to-day life, mainly because without such knowledge of IT, a country lacks what it takes to be competitive in the global market. Furthermore, a positive attitude should be promoted towards IT. Policies should encourage a paperless environment by providing all Saudi schools with an educational portal for teachers, administrators and learners, in order to enhance the accessibility of resources, offer a room for communication between teachers and learners, ease submission of assignments and ease the grading system. Moreover, all of the technological tools that exist in schools should be developed to provide network access. By undertaking all of these recommended strategies for incorporating IT in to the education system, Alshmarany et al. believed that Saudi Arabia would cater for future needs adequately. They concluded their study by stating that "It does not matter how behind the country is as success is never achieved overnight. As long as there is a vision and determination, this development is achievable" (p.5). We can understand that the educational system of Saudi Arabia has lacked strategic as well as operational ICT policies. Thus, it is less likely to integrate ICT effectively with the absence of these two essential policies.

It is important also to shed some light on other countries that have been successful in implementing ICT policy in their educational system. The Netherlands, for example, initially began in 1980 by introducing and implementing a comprehensive policy plan called the Informatics Stimulation Plan. It was characterized by involving five different activities (infrastructure development, school-sector specific activities, in-service and preservice teacher training and research) and was strongly supported financially. Teachers were also trained to use IT facilities in a pedagogical responsible way. The Netherlands became much more concerned about a new learning approach which was based on stimulating learners

with self-directed activities(e.g Veugelers, 2004). However, this new learning faced much opposition from learners, parents and parts of the teaching profession and became much more political, so that the Dutch state secretary of education delayed officially the introduction of the new approach until it could show evidence of its impact (Doorduyn,2007).

Many of the pedagogical reform movements point out that transforming an educational system is very difficult. Collis and Moonen (2001) argued that policy will succeed only if it is implemented as a core technology in teaching and learning. However, they point out that the majority use of ICT in education systems was a complementary tool.

Summarizing the policy dimension by Table 3-6, we can see that the policy makers have a key role in promoting ICT integration at the schools. This raises the question of what needs to be happening at the policy level ?

Table 3-6 Enablers and obstacles of the policy dimension

Enablers	Obstacles
• Clarity of ICT policy (e.g. Albugami & Ahmed, 2015; Kozma, 2008; Voogt et al., 2013) • Formulating goals and visions in policy-related document at national, regional and school level (e.g. Pettersson, 2018) • The combination of strategic and operational policies (e.g. Kozma, 2008; Taylor, 2008). • A logical sequence of ICT policy is needed (e.g. Moonen, 2008) • Realistic plans and goals (e.g. Alshmrany et al., 2014) • Policy frameworks need to align changes that are needed in curriculum, pedagogy, and assessment. • Policy makers need to encourage schools by providing basic knowledge and skills about IT and supports its use in the daily school practice (e.g. Moonen, 2008) • Policy makers need to have positive attitude towards IT and encourage a paperless environment and internet access at the schools (e.g. Alshmrany et al., 2014) • Policy makers need to Implement ICT as a core technology of teaching and learning (e.g. Collis & Moonen, 2001)	• Lack of ICT policy (e.g. Albugami & Ahmed, 2015; Kozma, 2008; Voogt et al., 2013). • Lack of a logical sequence of ICT policy (e.g. Moonen, 2008) • Lack of shared ICT policy at school, national and regional level (e.g. Pettersson, 2018) • Lack of interest for Policy makers to promote schools to provide basic knowledge and skills about IT (e.g. Moonen, 2008) • Lack of clarity in ICT policy (e.g. Albugami & Ahmed, 2015) • lack of supports for Policy makers to encourage ICT use in the daily school practice (e.g. Moonen, 2008) • Lack of positive policy maker attitudes toward ICT (e.g. Alshmrany et al., 2014) • Lack of support to provide schools and public institutions with internet access (e.g. Moonen, 2008). • Lack of strategic as well as operational ICT policies (e.g. Kozma, 2008; Taylor, 2008). • using ICT in education system as a complementary tool (e.g. Collis & Moonen, 2001).

3.5 CPD

Garba et al. (2015) highlighted that to use technology in an innovative way in the educational process, as desired in 21st century learning environment, teachers are required to have sufficient technological pedagogical knowledge. This means that teachers understand the interplay and connections between technology and pedagogy and have the skills to use such technologies in teaching subject content. This is often described as technological, pedagogical content knowledge (TPACK). Their results showed that, although there was provision of resources including a LP and the teachers had sufficient knowledge and skills to use ICT, the learning and teaching had not been changed as desired. They further highlighted that the lack of TPACK, fast emerging technology and administrative issues prevent Malaysian teachers from taking advantage of the available resources in their teaching and make it complex for the teachers to adopt 21st century teaching and learning approaches that require hands on technology. They suggested providing teachers with CPD that focused on TPACK to help them to take advantage of ICT tools in their teaching process. According to Avalos (2011), professional development is essential for introducing new ICT tools successfully in classrooms. However, many recent studies such as From (2017); Wastiau et al. (2013) and Pettersson (2018) demonstrate that digital competence should not be treated as an isolated phenomena based only on the level of the teachers, but be considered as an organizational task that is affected by contextual factors involved within the whole school. Therefore, Wastiau et al. (2013) concluded that ICT integration and development of digital competences need leadership, supportive organizational infrastructures and an inclusive organization of policies.

Teachers are considered to be at the centre of reform (Cuban, 1990). Hence, professional development for teachers is the main focus of systematic reform initiatives (Corcoran, 1995) and for ICT (Vanderlinde and van Braak, 2010). Although most studies have generally agreed on the importance of CPD, researchers have reported different perspectives toward its definition. Guskey (2000), for instance, has attempted to define CPD as "those processes and activities designed to enhance the professional knowledge, skills, and attitudes of educators so that they might, in turn, improve the learning of students."(p.16). In this definition, it is clear that Guskey focused on intentional CPD activities.

Guskey also set out five levels that needed to be considered when evaluating professional development and these were:

1. Participants' reactions: This level focused on participants' reactions to the experience, often whether or not they liked it.

2. Participants' learning: This focused on measuring the knowledge and skills participants gained.

3. Organization support and change: This focused on gathering information about the organizational as any initiative can fail if not supported

4. Participants' use of new knowledge and skills: This level focused on whether participants are applying their new knowledge and skills.

5. Student learning outcomes: This focused on gathering information about student performance and achievement, though could include broader measures such as students' attitudes and well-being.

These levels were arranged from basic to more complex ones. For example it is relatively easy to find out if teachers enjoyed a session, but more demanding to find out if a CPD session six months earlier was impacting on teaching and learning. The model also assumes that success at one level was important for success at the level that follows (Guskey, 2000). It is clearly challenging to evaluate the impact on learning outcomes as there are so many things to consider and it is unlikely that any changes can be directly attributed to a particular CPD experience. For example, in one study Nicolaidouab and Petridouabc (2011) evaluated CPD in Cyprus and looked at factors including participant satisfaction, learning and application of new knowledge and skills, and organizational support, but not learning outcomes. However, they suggested that while change could be promoted through CPD, it needed the support of organisations. They concluded that CPD needed to be long term and become more embedded in organizational operations and school leaders needed to be supported in their efforts to implement change within the educational system.

Many now accept Day's definition (1999) that professional development "consists of all the natural learning experience and those conscious and planned activities which are intended to be of direct or indirect benefit to the individual, group or school, which contribute, through these, to the quality of education in the classroom. It is the process by which, alone and with others, teachers review, renew and extend their commitment as change agents to the moral purpose of teaching; and by which they acquire and develop critically the knowledge, skills, and emotional intelligence essential to good professional thinking, planning and practice with children, young people and colleagues throughout each phase of their teaching lives." (p.4)

Day saw three different ways in which learning could be gained; naturally occurring, opportunistic or planned. He wanted teachers to be provided with an environment that

enhanced their learning through engaging them in a range of formal and informal activities. He felt that CPD was should be something that teachers usually did, not something done to teachers.

3.5.1 **ICT CPD**

As has been discussed previously in this chapter, ICT has a strong correlation with the promotion of educational change and such change itself is considered as a complex process. One of the difficulties in promoting change is that a teacher's teaching practice has become well established over many years. Gill (2017) found that ICT CPD was considered the most important variable in explaining teachers' ICT use in the classroom. Vanderlinde et al. (2014) was interested to explore which factors are related to the use of ICT in Flemish primary schools and found that ICT CPD had a positive relation with 'Institutionalised ICT use'. Abdulrahman (2016) examined factors that influenced the acceptance of secondary school teachers toward using e-learning technologies in Saudi schools and found that in-service training played a role, both direct and indirect on teachers. He found that training helped teachers to see the usefulness of using e-learning and improve their ICT skills. This affected positively their attitudes towards e-learning and their behavioural intentions, which, in turn, affected their actual use. We can understand that ICT CPD has a key role in changing teachers' attitudes and behaviours toward ICT use in the classroom.

According to Shulman (1986), teaching practices need to be built on an integration of content knowledge and pedagogical knowledge, which he referred to as PCK. PCK covers knowledge about the subject matter and knowledge on how to deliver this content to learners. Koehler and Mishra (2008) expanded Shulman's notion by adding technological knowledge to his term. They identified different types of technology knowledge that need to be addressed while integrating ICT in to teaching and these will be described briefly:

Pedagogical Content Knowledge (PCK): This refers to the knowledge of pedagogy, for example knowing appropriate approaches to teaching the subject content.

Technological Knowledge (TK): This refers to knowledge of both standard technologies and more advanced ones. It covers both abstract knowledge and technical know-how.

Technological Content Knowledge (TCK): This covers knowing how to connect technology with content. This implies that teachers should learn not only how to convey the subject matter they teach but they also know how the content changes by the application of technology.

Technological Pedagogical Knowledge (TPK): This refers to teachers' awareness of a range of ICT tools and an ability to choose particular ICT devices that fit well with their content and teaching purpose.

Technological Pedagogical Content Knowledge (TPCK) goes beyond a discrete understanding of content, pedagogy and technology. It focuses on good teaching with technology. With TPCK teachers use technologies in intelligent ways to teach content and to help address student difficulties, knowing what might make concepts difficult for students or for particular types of students. Teachers should have a combination of technical skills as well as content and pedagogical knowledge in order to implement ICT.

The idea of TPCK implies that the training of teachers in ICT should not simply focus on technical issues but also cover curriculum goals and issues of pedagogy. There is a need to train for TPCK. For example, Gillespie, Boulton, Hramiak and Williamson (2007) argued that teachers' skills were not aligned with more advanced ICT tools and suggested that teachers needed to be 'upskilled' with new thinking about pedagogy in order to integrate ICT use. Thus ICT CPD could be defined as balancing teachers' technological pedagogical knowledge (TPK) and technological content knowledge (TCK), in that any training programme should address knowledge about how technology may be used to provide new ways of teaching content (Niess 2005), and the "knowledge of the existence, components, and capabilities of various technologies as they are used in teaching and learning settings" (Mishra and Koehler 2006, p.1028). Many researchers found that the integration of the two concepts in teachers' professional development helpful. Boulton (2017), for example, conducted a training event that focused on developing teachers use of Web 2.0 technologies within their subject-related pedagogy. In her study, she found that this type of training contributed to progressing learners' literacy level in subject disciplines and made disaffected learners more engaged with their learning. She further claimed that "student learning outcomes were a result of teachers' development" (p.79).

The link between TPCK and ICT CPD is clear in other writing. For example Pachler et al. (2009) understood ICT CPD as "professional development activities and experiences, including skills training, which enhances pedagogy across the curriculum and beyond, and which helps to deepen teachers' knowledge and understanding of how to use technologies effectively in teaching and learning, including for professional administrative activities. It includes a spectrum of both formal and informal arrangements, which help teachers use

technology, and may involve both in-house and a range of external or networked bodies, which contribute to those arrangements" (p.3). Thus, we can understand that ICT CPD, generally, aims to develop teachers' knowledge and skills toward integrating technology with teaching and learning and this could include formal or informal initiatives carried out by the teachers themselves or it might be offered as a part of an educational reform process.

There is a clear need to provide teachers with organised programmes in order to develop their competences, skills and knowledge. This training needs to be differentiated as teachers have different levels of expertise; training needs to be personalised. Sun (2000) suggested distributing a survey to school teachers and administrators before conducting ICT CPD courses. In this way, planners can design courses according to the participants' needs and accommodate their various levels of expertise.

We can understand from discussion of TPCK and of ICT CPD that training should cover all aspects not just technology know-how. There are some strategies highlighted in the literature which help us to develop TPCK competences. For example, trainers should seek the active engagement of the teachers in the design of training (Koehler and Mishra, 2005b) and here Koh and Chai (2014) found that the engagement of the pre-service teachers in the design process had a positive impact on TPK and TCK growth. Second, trainers could focus on specific disciplinary areas rather than general pedagogy (see Niess, 2005; Voogt et al., 2012; and Khan, 2011). Khan, for example, showed science teachers how technology could be used to help student learn Chemistry. In this study, it is important to see if the CPD offered covers all these various strategies or focusing on one or two.

This means that in my study was the CPD about developing technological know-how or a more integrated approach that allowed teachers to see how the use of Classera could support their curriculum goals and even improve their knowledge of teaching in the first place. Second was the training responsive to teachers or something that was placed on teachers. Third was there support available which was responsive to their concerns as teachers and the kinds of activities they would do as teachers.

3.5.2 **Types of CPD**

Pachler et al. (2009) identified models of ICT CPD which are school-based or "in house' and external offered, for example, by Local Authorities, City learning centres and Commercial companies. Commercial companies more often provide skills training courses to support the purchase of new software without involving pedagogy development. Outside expertise may however be based on different models based more often on commercial interest; schools' requests for particular training or outside agencies may offer return visits for schools in order to support some form of follow up activity. Pachler found through interviewing both primary and secondary schools that school-based and in-house CPD was the prevalent model on grounds of cost.

3.5.3 **The features of effective ICT CPD**

Pachler et al. (2009) see successful ICT CPD as characterized by having a strong sense of community and a high sense of sharing knowledge. Thus, teachers who have experience of ICT should be provided with the chance to share that knowledge with less experienced ones. According to Pachler et al., informal discussions between teachers are vital as they give teachers the opportunity to share, plan and talk to each other about new approaches. Thus, Pachler et al. (2009) found that teachers, senior leaders and CPD providers saw the

key influences on the efficacy of ICT CPD as being leadership, time, informal learning, a sense of community, and a clear links between CPD and practice.

- School leaders not only have a key role in encouraging their teachers to implement ICT in schools, but also have a significant role in shaping ICT CPD. Effective leaders do not just make the best use of the expertise of their staff in terms of their ICT skills, but they play a significant role in terms of setting up collaborative peer learning which make the most of excellent practitioners and good communicators.
- CPD needs to be sustained over time and give teachers sufficient opportunities for in-depth study, interaction and reflection. They further point out that this will also provide teachers with the opportunity to try out the new teaching practices and receive feedback on what they have to teach.
- CPD activities should be directly applicable to classroom settings and ICT needs to have a clear objective that aim to promote learning. Most of Pachler et al.'s participants saw time spent in working collaboratively with colleagues to plan and review their classroom strategies as productive.
- Although, informal learning does not require to be planned, democratic relationships among staff and lively staffroom talk were the aspects that facilitated this type of learning in schools.
- This strong sense of community can be promoted, as has been mentioned previously in the leadership section, by the presence of effective principals who create a learning environment for their teachers.

Although sharing experiences between staff plays a significant role, schools can become “inward-looking” and they suggested that teachers should be provided with internal and external expertise in order to widen their horizons.

In addition, Sun (2000), through his experiences with thousands of schools, agreed with this notion: he has noticed that training courses are usually very limited and tend more often to be on the mechanics of technology operation. He, therefore, suggested that professional development for technology must be comprehensive, through which it should not only focus on developing teachers’ technical skills and knowledge, but also involve strategies for technology-promoted teaching and learning. In addition, he pointed out that professional development should not only make teachers aware of how to use technology effectively, but they should also understand the reasons for employing technology. Thus, the professional development plan needs to involve goals that address both the how and why of using technology with teaching and learning. He further proposed to start CPD with some principles of teaching and learning before introducing hardware and software. Thus, CPD will have a strong influence on teachers’ performance if it is framed as: "Let's look at what students are learning this year and then see how technology can make it more effective." (Sun, 2000, p.19). On the other hand, informing teachers that "Now what you need to do is integrate word processing into your lesson plans," might work with teachers who are motivated, but it could not work with the many others who may need much more support. Therefore, Sun has briefly argued that teachers face a difficult time when implementing technology skills into their teaching practices unless they are related directly to the curriculum, to teaching strategies or even to the progress of their learners’ achievements. Becta (2004) further suggested that ICT CPD should address both the pedagogical aspects and the development of teachers’ technical skills. Furthermore, ICT CPD should not solely

involve teachers within in-service training but should also lead them to experience ICT before applying it in the classroom (Albirini, 2006).

Exploring this issue of community further, Hadjithoma and Karagiorgi (2009) carried out a multiple case study in primary schools in Cyprus in order to investigate the impact of the type of school community on the quality of ICT implementation. The study identified two types of community practices. The first is a school-wide community which has provision of ICT resources, a positive and collaborative school climate and a principal with a leadership style that allows exchange of ideas and expertise. The second is where there is an absence of exchange of information on practice among teachers and the principal and the use of ICT is developed in a competitive way. They found that the type of school community has a great influence on the quality and extent of ICT implementation and the circumstances under which such communities emerge play an important role in the success of ICT implementation.

Along the same line, a study of UK schools (Tearle, 2003) investigated the factors that impede the implementation of ICT. It identified the main features that characterised an ICT-capable school, as the strong lead of school heads, collegiate work patterns amongst the staff and adequate access to ICT resources, support, and sufficient staff ICT training. This is backed up in studies by Li and Wong (2006) and Sheppard (2003). To conclude, it seems that effective ICT integration needs a sympathetic culture and a mix of inputs.

Summarizing the CPD dimension in Table 3-7, we can see that ICT CPD is important if teachers are to use ICT effectively. This raises the question of: What kind of CPD seem to support the teachers to use ICT in their practices?

Table 3-7 Enablers and obstacles for the CPD dimension

Enablers	Obstacles
• Providing teachers with internal and external expertise (e.g. Pachler et al., 2009) • Providing teachers with sufficient opportunities for in depth study, interaction and reflection(e.g. Pachler et al., 2009) • Developing teachers TPACK competencies (e.g. Niess, 2005; Garba et al., 2015; koehler, 2008) • Providing teachers ICT CPD based on their needs (e.g. Sun, 2003) • Providing sustainable CPD over time (e.g. Pachler et al., 2009) • Providing supportive leadership, ICT infrastructure and an inclusive organisational policies (e.g. Wastia et al., 2013; Tearle, 2003) • Providing teachers with an environment that has a strong sense of community and high sense of sharing knowledge(e.g. Pachler et al., 2009) • CPD needs to be directly applicable to classroom (e.g. Sun, 2003; Pachler et al., 2009)	• Developing teachers ICT skills only (e.g. Garba et al., 2015) • Fast emerging technology (e.g. Garba et al., 2015) • Lack of supportive leader who promote a sense of community (e.g. Garba et al., 2015) • Lack of ICT CPD (e.g. Pachler et al., 2009) • Treating digital competence in an isolated phenomenon (e.g. From, 2017, Pettersson, 2018) • Lack of sufficient opportunities for in depth study, interaction and reflection(e.g. Pachler et al., 2009) • Lack of ICT infrastructure and ICT policy at the school (e.g. Wastia et al., 2013)

After examining all the factors, there is still an unanswered question about how all these factors work together and how we can get to a future position of ICT integration. There are optimistic, and pessimistic, debates too about technology and these will be picked up in the discussion chapter.

Theorizing ICT Uptake and Use

Various models, as well as looser diagrammatic representations, have been put forward in the literature. These different models have addressed diffusion, acceptance, adoption and use (for example Ajzen & Fishbein, 1975; Davis, Bagozzi & Warshaw, 1989; Engestrom 1987; Rogers 2003; Cartwright & Hammond 2007). The main aim of a model is to highlight the key elements within the context of a study.

One of the most influential models is the Technology Acceptance Model (TAM) that was introduced by Davis, Bagozzi, and Warshaw (1989). The model highlights two important

determinants that cause people to accept or reject using ICT. In other words, these two conditions help to predict the individual's acceptance and potential use of technologies. The first determinant is perceived usefulness, which is defined by Davis, Bagozzi, and Warshaw as "The degree to which a person believes that using a particular system would enhance his or her job performance."(p.3). This mean that the people may tend to use or not use ICT based on the extent to which they believe technological tools help them perform their job better. The second condition is perceived ease of use which has been defined as "The degree to which a person believes that using a particular system would be free of effort." (p.3). This term means that while people may believe that a given application is useful if they perceive it as hard to use, then they still will not use it.

This model has a great deal of support in the literature and has been repeatedly used to explain the take-up of ICT (see, for example, Edmunds et al., 2012; Lee & Lehtos, 2013). The model is also capable of being amended and has been used flexibly over time. A key strength of the model is that it seems to connect with what you might believe is common sense about adoption.

However, TAM does have important limitations. The key one is that it looks much more at the individual level or micro level; it seeks to explain take-up by looking at teacher attitudes towards the software but has less to say about the context of the schools and schooling. This can be seen in Zahrani (2016) in which TAM was used to understand the factors and attitudes that affected acceptance of e-learning technologies by Saudi secondary teachers. He found that perceived ease of use of e-learning and perceived usefulness influenced teachers' behaviour. However, what is not seen in this study, and many others that have used TAM, is that it does not fully address factors at the institutional level that have the potential to frame teachers' attitudes in the first place. In fact, TAM was not developed

with education in mind so the main reason of not using this model in this study was that I wanted to consider wider issues such as curriculum and training and so on. Usefulness for the teacher needs to be explored in the context of what matters for the individual in an environment in which a variety of things are expected.

Limitations in the use of TAM have also been noted by several researchers. Chuttur (2009), for example, identified these criticisms under three main categories. Firstly, the methodology in TAM studies tends to rely upon self-report data instead of the system in use. Another methodological criticism is that evaluation studies cannot be generalized because they often involve a controlled environment (Y. Lee, Kozar, and Larsen, 2003). Secondly, the relationships and variables within the model have been criticized as incomplete (see, for example, Burton-Jones and Hubona, 2006)). In other words and as mentioned earlier, there are some external factors such as supportive leadership that could have a direct influence on system usage. Thirdly, the theoretical underpinnings of TAM have been criticised. According to Bagozzi (2007), there are critical gaps when applying the model (individual reactions to using IT leading to intentions to use IT, leading to actual use) in practice. In other words, teachers may express some interest in using IT, but these might not in practice lead to the use of technology. There is a wider issue here that a model based on behavioural responses has been taken up by education technology researchers who have frequently argued for a social constructivist pedagogy. This presents a mismatch in epistemological perspectives.

Although studies have used TAM to investigate the adoption of e-learning, writers such as Sumak et al. (2011) and Islam et al. (2014) point out that the TAM model was not developed in relation to e-learning and should be revisited. Shee and Wang (2008) add that e-learning systems require interaction between teachers and learners and thus both

contribute to technological integration. Schoepp (2005) added that there were many other factors such as the availability of ICT infrastructure, educators' roles and teaching beliefs that contribute to the success or failure of an e-learning system. Although the TAM model has been modified into the electronic learning technology acceptance model (ELTAM) and used by many studies, it is believed that the model does not capture all that is happening in the take-up of ICT. According to Sumak, HericKo, and Pusnik (2011), these models are more appropriate for use to investigate acceptance and adoption of e-learning systems. In fact, this is later (see chapter five) shown in my study in that teachers' attitudes were similar in all five schools but adoption varied. This shows the importance of understanding the context. Thus, this study has adopted a more grounded approach that was more iterative, inductive and ultimately flexible.

Summary

This chapter has focused on examining the main factors that play key roles in successful ICT implementation. Through in-depth review of both the literature in the Saudi context and the international literature on successful ICT implementation in school education, we concluded that ICT adoption requires many changes and many challenges to be addressed. The teacher dimension, leadership dimension, infrastructure dimension, cultural dimension, parents' participation dimension, policy dimension, and training dimension are the main factors that have been discussed. As we saw earlier, the relationships between these aspects are interdependent and interrelated but not linear. We can confirm that ignoring one of these aspects could affect the success of the whole process. This suggests in regard to Classera that implementation will not be easy.

Chapter 4 Methodology

4.1 Introduction

The present study grew out of concern about the use of VLE in schools. I believed that only through describing the contexts, interacting with the heads and teachers, and observing teachers' practice I would understand the whole picture of the programme phenomenon. In this way I could identify opportunities and constraints which Classera offered and access practitioners' perspectives. This chapter will highlight my research paradigm in order to understand the theoretical assumptions underpinning my study and to clarify the reasons for using this particular paradigm and associated methods. The research design of the study, the context of the study, the methods and the stages of data collection will also be discussed. This chapter then presents the procedure for the data analysis, evaluation of the instruments and ethical issues.

This chapter is divided under 9 sections covering:

- Methodological paradigm
- Data collection methods
- Research design
- Context of the study
- Data collection stages
- Data analysis procedure
- Evaluation of the instruments
- Ethical issues
- Summary

4.2 Methodological paradigm

Punch (2009) defined a paradigm as “a set of assumptions about the world, and about what constitute proper techniques and topics for inquiring into the world.” (p.16). A paradigm takes in epistemology, ontology and methodology. Punch provided more detail by identifying three main questions associated with a paradigm:

1. The ontological question that asks about the form and the nature of the reality.
2. The epistemological question that focuses on the relationship between the researcher and the reality.
3. The methodological question that is based on what methods the researcher can use to find out more about the reality (Punch, 2009).

These fundamental questions refer to the relationships between underlying philosophical issues and the methods used. Paradigms have generally been covered in terms of positivism and interpretivisim (Punch, 2009). In more detail, positivists believed that “the objective accounts of the world can be given” (Punch 2009, p.18) and believed that the techniques of natural science could provide objective knowledge in the form of modules and even laws. Such a paradigm is likely to be related to quantitative methods. Positivism is characterized by its emphasis on the scientific method, generalizable findings and statistical analysis. Interpretivism, on the other hands, is most likely associated with qualitative methods and a concern for the meanings people bring to a situation (see for example, Oates (2006)). Thus, researchers need to understand and interpret human actions through deep involvement in the social realities of their field of study. This paradigm favours the study of people in their natural social setting rather than in unnatural, including laboratory, ones. Interpretivists believe that there are multiple interpretations rather than a fixed generalizable law.

Each of these two paradigms has strengths and limitations. One of the main differences between them lies in assumptions about the researcher's objectivity. In positivism, researchers claim to be objective and seek not to influence the environment they investigate. Positivists might be more interested in undertaking large-scale surveys to obtain a general overview about society as a whole. They are also concerned to find out more about social trends. For example, they might investigate the relationship between social class of the learners and their achievements in school. In other words, they are investigating trends, patterns, factors, causes and correlation. In contrast, interpretivists believe that human being are not blank pages who are formed only by external social forces but they have a consciousness and can seek to understand reality and make individual choices about their lives. Grey (2011) proposes that researchers with interpretivist beliefs are interested in investigating the context of the research study and are willing to accept the subjectivity of their judgements. Grey further points out that if the researchers understand the environment under investigation very well, they will be able to provide valuable interpretations.

The adoption of a particular paradigm depends on the context of the study, the nature of the research questions and the researcher's philosophical understanding, experience and personal beliefs (Denzin and Lincoln, 1994). For example, my philosophical understanding of the world is that people (myself included) have relative autonomy to make decisions. However, their actual choices and activities are heavily structured not just by culture but also by the available tools and resources. This resonates with the literature on the take up of ICT, where there is a strong interest in the characteristics of people who take up ICT. For example, the interest in early adopters who seem to exercise a great deal of agency in the use of ICT. However, the literature also shows the strong constraints related to leadership and ICT resources. What seems clear is that we need both an understanding of

people and of the context they live and work in. This has often led to an interest in mixed method research. In order to investigate the use of Classera, I have adopted a mixed methods paradigm as this enables me to understand the motivations of people in using ICT or not using ICT as well as to grasp the more general issues that would become observable in the classroom and be found more generally within the surveys.

According to Johnson et al. (2007), mixed methods is "an intellectual and practical synthesis based on qualitative and quantitative research; it is the third methodological or research paradigm (along with qualitative and quantitative research). It recognizes the importance of traditional quantitative and qualitative research but also offers a powerful third paradigm choice that often will provide the most informative, complete, balanced, and useful research results" (p.129). This shows that comparison of data from different sources is a really important aspect of mixed method research and it also shows the decisions about methods can be made depending on what is most appropriate for a context rather than having a fixed idea that quantitative or qualitative is best by itself.

My study explored Classera use by accessing a VLE in schools, through exploring the perspectives of the heads and teachers and then assessing the factors that encouraged or discouraged teachers to use it. This then is a classic mixed method study looking at the decisions taken and pattern of use. Thus, the nature of the research questions of the study required a deep understanding of school context in terms of school community, headteachers' role and leadership styles, the infrastructure of ICT, teachers' roles, practices, their actual use of Classera, their beliefs about Classera integration in their daily teaching practices, and the nature of ICT support. These questions could be addressed by qualitative and quantitative data. Through using surveys, interacting with heads and teachers and observing some lessons; I gained access to a holistic picture of

VLE use including the opportunities and difficulties teachers experienced. Using a single method would not provide the comprehensive understanding for this study. I agree with Sachdeva (2009) that using qualitative methods with quantitative ones provides a fuller understanding of a research situation. Sachdeva felt that the results of qualitative research could offer some indication as to "why", "when" and "how" but cannot show "how often" or "how many" (Sachdeva, 2009). Thus, combining the strength of both methods supports triangulation to increase the validity and reliability of the data. Additionally, Punch (2009, p. 290) points out that "we can learn more about our research topic if we can combine the strengths of qualitative research with the strengths of quantitative research while compensating at the same time for the weakness of each method."

4.3 Data collection methods

The study used a mixed method approach involving interviews, observations and questionnaires. Previous research studies conducted in relation to the integration of ICT in educational contexts tend more often to use mixed-methods approach in designing their studies as (AL Ghamdi, 2015; Binothman, 2015; Gamlo, 2014; Nasser et al., 2011; Tearle, 2004). Nasser et al. (2011), for instance, investigated the usage of the Qatari VLE through using a mixed-methods approach. They used a quantitative strategy in the initial stage for both of teachers and students which led to five schools being chosen and semi-structured interviews conducted. Binothman (2015) examined the Tatweer programme in Saudi schools by conducting several interviews with teachers, students and senior managers and analysing documentation in order to gain insights for designing a questionnaire for both teachers and students. My strategy used a qualitative semi-structured interview in the first phase of the study after which a questionnaire was designed. Mixed method studies then differ in terms of their timing dimension, weighting dimension and mixing dimension (

Creswell and Clark, 2007). In other words, the order of using and collecting data, whether consecutive or sequential or whether one method is given priority over the other, differs from one study to another. Creswell and Clark (2007) suggest four main mixed methods design including triangulation design, embedded design, explanatory design and exploratory design.

This study uses an exploratory and embedded design. I used exploratory design to understand more about Classera and to know which schools were using it. This was followed by developing a questionnaire for distribution to a large sample of teachers. An embedded design was used in the second part of the study, where subsamples of heads and teachers were interviewed and some classroom observation took place. Later sources of data were triangulated.

4.4 Research design

To answer the research questions, I carried out a multiple case study. According to Yin (1994), a case study is "an in depth inquiry that investigates a contemporary phenomenon within its real-life context" (p.13). The major criticism of case study that has been raised in the literature is that its dependence on a single case means it is unable to provide a generalizing conclusion (e.g. Miles, 2015; Tellis, 1997). A subsidiary concern is that many case studies are seen as methodologically weak and dependent on subjective interpretation (see the discussion in Stark & Torrance, 2005). Supporters of case study argue that these criticisms miss the point; the idea of case study is not to generalise but to develop models and theories that might be relatable rather than generalisable to other contexts. In order to do this, of course, case studies need to be seen as methodological sound or trustworthy. Thus, many case studies, as in my example, use triangulation so that findings are not based on the views of a single informant or group of informants and perspectives on action can

be contrasted with the behaviour of key actors (see Yin, 1999). Case studies are multi-perspectival analyses that tend to focus on one or two main issues to understand the system being examined (Tellis, 1997).

Case study is often used in education research into technology because the tools being used are new and there is little in the way of generalisable hypotheses to test. Case studies can be contrasted with quantitative studies. For example, Raftery and Risquez (2018), conducted a quantitative survey of the use of VLEs in higher education in Ireland which resulted in 3,332 student responses in 2011 and 5,170 when the survey was repeated in 2013. Such a large quantity of data make the findings appear generalisable, at least to Ireland, but unlike case study does not lead to detailed modelling or theory generation as does case study. All research offers different insight. In my study, I am not arguing that case study is better or worse as a methodology but that carefully constructed case study enables the researcher to go deeper and provides the opportunity to create models and frameworks. All methods need to be chosen for their fit with the research questions being asked and case study is the best way of addressing my overall aim of describing and explaining the varied use of Classera, including the identification of the opportunities Classera provided and the difficulties that obstructed its use.

In case study, generalisability is best replaced with relatability. Bassey (1981) goes on to say it is more important that an individual is able to relate to an external case study and interpret the findings for their own decision-making purposes, rather than simply use research to claim generalisable conclusions. In order to be relatable, the reader of a case study must be able to see the context in which the study has taken place (in this study this is covered in chapter 4) and be able to follow the steps taken by the researcher (see methodology in chapter 4) so that he or she can compare and contrast to their own

context. In my case, relatability is made easier if the reader is familiar with the context of private girls' schools in KSA; for example, he or she is a practitioner researcher or school leader in that particular sector; but, in principle, the frameworks developed in the study should be relatable to other contexts too. However, any models generated from my context will need to be adapted so that relatability refers more to a way of looking at the problem (e.g. a modelling of different factors and a recognition that through their strategies teachers make or do not make technology work) rather than expecting to see the same organisation of, say, intervening and contextual factors that appeared in my study.

Yin (1994) points out different classifications of case studies based on number, design and types. In terms of number, some are single cases, which focus on studying a unique event, while some involve multiple cases which allow similarities and differences to be investigated. The strengths and weakness of both type of studies are mirror images of each other. The strength in a single case is that one can go deeper by spending more time in collecting and analysing data and really understand the context in which something is happening. This is particularly useful when it is a unique case. However, the disadvantage is that one can lose the wider picture and the researcher can become too engaged in a single case, whereas the researcher in the multiple case studies design provides a more general view of a phenomenon through comparing and contrasting between different cases. At first sight, multiple case studies are more trustworthy because they show that something is happening or not happening in more than one site, which seems to lend them the greater generalizability to make the case stronger. However, this is not always so. For example, because one is looking at more than one case, one may lose sight of the particular context and one might end up by comparing and contrasting things that arose from very different circumstances. Often in multiple studies there is a pressure to look for similarity when in fact diversity might be more important. In my study, I had to bear in mind that according

to Classera data, schools were using Classera at different levels and this made me interested in finding out more about why these different contexts had led practitioners to identify the opportunities and constraints teachers experienced.

Case studies are also distinguished by type: explanatory, exploratory or/and descriptive. Explanatory research attempts to set out to explain something already observed, focusing on specific aspect of a case that has been identified in advance. The focus on exploratory is usually in settings where not very much is known in the first place and the researchers are attempting to understand what is happening; it might have a more deductive logic in terms of design as there is not much to go on. Descriptive studies seek to bring out characteristics of real life contexts, often with the aim of letting people understand something that they might not be aware of (it is new or under-reported) or perhaps of giving voice to marginalised groups. However, real life studies cannot be divided easily in these ways. All studies have explanatory, descriptive and exploratory elements, with the question being where the researchers put their focus. One is not necessarily better, with different elements appropriate to different situations. My study has a balance of focus on all these elements. For example, it has an exploratory rationale because Classera was new and we do not know very much about its use in Saudi Arabia. The study itself is also descriptive because it describes the context and what people are doing in that context. It is explanatory because it introduces a modelling of the factors and strategies that lead to high and low ICT use.

Case studies are also classified based on design. A holistic case study is attempted to understand the global nature of a phenomenon and concerned with a single unit of analysis. An embedded case study design focuses on sub-systems as well as the main one and thus include more than one unit of analysis. Embedded design is regarded as a

powerful approach where it attempts to investigate a phenomenon in context with different variables. A holistic case study design is unable to study the case in depth and is therefore unable to provide a particular phenomenon with operational details. In other words, researchers who are interested in multiple embedded case studies focus on drawing conclusion from the subunits they investigated. For example, I examined the use of Classera in schools through looking at different variables such as infrastructure of the ICT in school, leadership style, school community, culture and the role of Ministry of Education. However, it was important to bring these together in a holistic picture of Classera use by introducing a model, which I describe later. This is because ICT integration occurs within a broader mediating context; it is not an isolated or independent phenomenon. Therefore, looking at factors by themselves will not provide me with a holistic picture of what is going in the schools and what opportunities and constraints teachers experienced.

My study involved embedded multiple case studies that were exploratory, explanatory, and descriptive in nature. It aimed to describe, explain and explore the use of Classera in five different girls secondary (11-18) schools. It also sought to determine the opportunities that were available for teachers to integrate Classera in their daily practices and identify difficulties that obstructed that use. The use of a case study approach was valuable in that it could deal with schools in real contexts and contribute to illustrating what opportunities could help schools to better integrate a programme in the future. The overall research design is summarized in Figure 4.1.

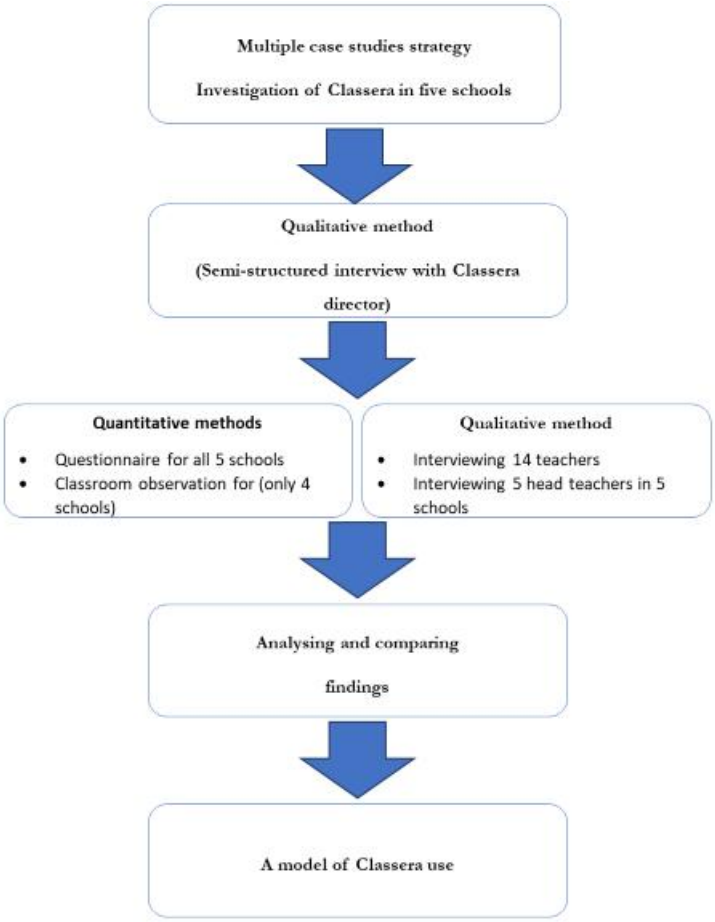

Figure4.1 Research design of the study

4.5 Context of the study

My study was carried out in five different female schools at secondary level in three different regions. The reason for choosing different regions was mainly because I wanted to confine the cases to something that was manageable and bounded so I choose ones that had secondary sectors in private and international schools. As explained earlier, Classera use was confined to these schools and, at that time, there was little happening in public secondary schools. What would be useful for my study would be to see different levels of use in different schools and in different regions. A big problem here was how to get access to the schools. In order to facilitate access, I talked to the Classera director, as I will explain in some detail. She recommended some schools for me that would show different levels of development with Classera, and that she thought would be more accessible and more open to my research. So, when I contacted these schools, I mentioned that their names were given to me by Classera and asked whether they would be willing to help in this study. In carrying out studies in technology, it would be very easy to find schools that did not make use of technology; by implication that is what happened in the Tatweer programme. I did not want to see five schools that were deeply engaged with using Classera, but I did hope that at least one of them would show high use because it would make a more interesting study if I could include different types of school use which I could both compare and contrast.

My first selection of schools was based only on a feeling that they would show a good mix of teaching different curriculum at different regions (British-American curricula and Ministry of Education system). I then contacted the headteachers in these five schools and they all agreed to take part. All the headteachers were themselves Saudi by nationality. The teachers themselves were mostly from Saudi Arabia, especially in most of the private

schools, but significant numbers also came from different countries, particularly in the international schools that taught most of their subjects in English. As mentioned in the Introduction chapter, international schools still employ teachers from different counties in order to address an English skills gap.

According to the data I gathered, Schools D and C employed only Saudi teachers. However, because school B had two systems, teachers were of various nationalities, including Egyptian, Jordanian, Syrian, Indian, British and Arab background. Although school A was only a private school, its teachers had varied nationalities too. As seen in the Introduction, the private schools were expected to employ Saudi teachers, but in practice this did not always happen. This was due to the owners of private sectors and their restrictions to follow regulations placed by Ministry of Labour. Finally, very few of the teachers at school E, which taught only British subjects, were Saudi nationals.

These schools shared some aspects but differed in others. In term of similarities, all of the schools were located in SA; were private female schools; and taught the entire age range beginning with the pre-school up to the secondary stage. Additionally, they were all using Classera but in different levels, which will be discussed in more detail in the following section. In terms of their infrastructure, all the schools had a computer lab learners could use in the company of their teachers. In regard to the variations, there was some differences which will be discussed below.

The headteacher of school A was aware of the extent of Classera use in her school, mainly because she checked this every day. According to her data, most of her teachers were using Classera and all teachers knew how to use the portal. The school head supported Classera use in her school in many ways. She set free time every day for the teachers to access Classera at school. Classera logs the rate of use by teachers and learners in every month.

This helped the headteacher to check who in each month made most use of the programme and to reward both teachers and learners for their active use. As the headteacher encouraged the most active users of the portal, she also set a clear consequence for teachers that are not using Classera. The school encouraged teachers to offer workshops for other colleagues. This ensured teachers had up-to-date knowledge about ICT educational devices. This was backed up when I later spoke to the teachers. One of the teachers pointed out that the school not only offered them time and workshops but also provided them with any ICT tools they needed (see the training section in the teachers' interview schedule).

The headteacher of school B mentioned that her teachers were not using Classera every day. She believed that teachers would in time get used to using it, as was the case with other ICT tools they applied in their school (see later in the headteacher interview schedule section). The school provided ICT workshops for the teachers every Sunday. In terms of the technical support, there was an IT department who were responsible for any ICT maintenance.

As mentioned earlier, the internet access in school C was provided only for the administrative work, but not for the teachers and the learners to use in the classes. One of the teachers later told me she brought her own router to the school to finish work and to share it with other teachers. In respect of teachers' use of Classera, the headteacher believed that the teachers enjoyed using Classera and they were using it frequently without the need for any sanctions.

The headteacher of school D had replaced all of the traditional boards in the classes with the interactive ones. She explained that she had personally decided to do so even though there had been no regulation from the Ministry of Education. She said she was aware of

the differences in ICT skills between new teachers and teachers who had worked with Classera for a long time in her school and believed that teachers' rejection of the use of ICT could not ignored. However, she was also aware of the importance of encouraging teachers to use ICT tools and understanding the reasons for teachers' rejection.

The headteacher of school E decided to use Classera in particular because it was offered by a well-known company and many of the approved international schools had started using it. Conversations between heads had covered why their school did not to use it (see later in the headteacher section). The headteacher explained that the use of Classera was considered a part of teachers' duties in the school and she expected teachers to use it daily. She added that they asked the IT department to supervise weekly teachers' use to identify active users from non-users. This helped them to find which teachers might need assistance. The headteacher explained that they called in teachers who appeared not to be using it and discussed the reasons. If the reason was mainly because of an IT problem, the teacher received help from the IT department until her problem had been solved. For any other reasons, the school sent three warnings letters at different times for teachers. If a teacher had still not taken the opportunity to use it, she would be dismissed from the school. The school principal pointed out that most of the parents, through surveys conducted by school, showed their interest in using the portal and were active users. The teachers agreed also that most of the parents preferred using Classera for interactions with the teachers rather than coming into the school. However, due to school regulation, no classes were observed. In terms of the technical support, there was an IT department in the school who provided any teacher that need help with ICT tools. Table 4-1 shows the general description of all the school contexts.

Table 4‑1 A brief description of private and international school contexts

Schools	School A	School B	School C	School D	School E
Type	**Private**	**International**	**Private**	**Private**	**International**
School system	Taught Ministry Educational curriculum only	Offering two systems involving American standard and Ministry Educational Curriculum	Taught Ministry Educational curriculum only	Taught Ministry Educational curriculum only	Offered British curriculum Only
Length of time since Classera introduced	Four years	Three months	Three years	Four years	Two years
Expected use of Classera	Regular use	Regular use	Low use	Regular use	Low use

4.6 Data collection stages

The study investigated the teachers' use of Classera in five girls secondary (11- 18) schools, which were located in three several regions in Saudi Arabia. Table 4-1 presents the data collection methods used and the reasons for adopting each method.

Table 4-1 Data collection methods used in the study

Stages	Objectives	Methods	Number of participants
Initial stage	Semi-structure interview used with Classera director to explore more about Classera, reported opportunities and constraints and to identify schools that might participate in the study.	Semi-structure Interview	N= 1
Second stage	Investigating teachers' perspectives towards Classera use, finding patterns in the data	Questionnaire	N=91
Third stage	Interviewing teachers and their heads	Semi-structure Interview	N of teachers = 14 N of headteachers=5
Fourth stage	Two lessons from three schools and three lessons for one school were observed in order to understand what is going on in the classroom.	Structured Observation	N of classes = 9

As can be seen in Table 4-1, the data collection ran across four different phases. The first focused on the interview with the Classera director. This interview took place in the preliminary stage of this research. As mentioned earlier, Classera had been only recently introduced and very little information was available about its use. Therefore, the aim of interviewing the Classera director was to gain background knowledge and to identify schools that were using Classera.

The second phase was distributing the questionnaires to the five schools that took part. The reason for using this method was to get a general understanding of their perspectives and to identify common enablers and constraints.

The third and the fourth phases involved interviewing a number of teachers and their heads and observing some classes. This helped me to gauge the level of their acceptance of Classera and establish any associated difficulties faced when using Classera in the classroom. I interviewed headteachers in order to understand more about the leadership offered in the school. For example, were they doing all they could to encourage the use of Classera. The observation of the classes was used to uncover whether there were things teachers could not mention in the questionnaire and provided me with a credibility check through comparing what teachers had said to what teachers were actually doing. The observations took place only in four schools, as will be explained in the following section.

4.6.1 **Interview**

Punch (2009) points out that interviews allow the researcher to access individuals' perspectives, meanings, and construction of reality. Kvale (1996) defined interviews as "an interchange of views between two or more people on a topic of mutual interest"(p. 14). He saw such interchanges as central for knowledge production. Interviews can be structured, semi-structured, or unstructured depending on the aims of the researcher (Punch, 2009).

Structured interviews are often used when the researcher is fairly certain he or she has covered all the key areas and wants all participants to follow the same sequence of questions. Bryman (2001) agrees that a structured interview is easier to analyse, but at one extreme it could end up being a questionnaire and the benefit of face-to-face interaction will be lost. Semi-structured interviews differ from structured ones by allowing the interviewer to ask follow-up questions and not be so restricted. The questions are generally more open. Unstructured interviews have only a very loose schedule or sequence of questions. This type of interview is often used when the researcher has little knowledge or preconception about the topic or is trying to 'bracket' knowledge and preconceptions.

In my study, I used semi-structured interviews first with the Classera director and again in the third stage of my study with heads and teachers. I decided to use semi-structured ones because through my reading and through my knowledge of the context I judged that the areas to cover were adequately known beforehand. On the other hand, I did not want interviewees to feel constrained. In practice, the interviewees were often keen to talk about their teaching and their use of technology and the semi-structured questions were used flexibly. The interviews gave the participants the chance to talk about the use of technology in their daily lives and their use of Classera and then to follow up any other less expected issues that arose. Nearly all the interviews were conducted in the first language of the participants, which was Arabic: this was an obvious choice because many of the teachers were not confident in English and they could express themselves much more fluently in Arabic. It had a disadvantage for me because my thesis is in English and so it required me to translate quite a lot for the benefits of a wider readership. Two colleagues did choose to speak in English, feeling confident because they were teaching in the medium of English language. In fact, these teachers were from India and were not confident of speaking in Arabic in any case.

4.6.1.1 Administering the interview of the teachers and heads

In carrying out the interviews, heads and teachers were informed about the purpose of the study and were assured that the data would only be used for research purposes. Additionally, permission was taken from each of the participants for recording the interviews. Most of the interviews were recorded digitally. The interviews with both heads and the teachers followed clear guidelines. Firstly, I discussed with each of them about the best time and place to conduct the interview. Then, after time and place were established, the purpose of the study was introduced and a description of the questions was provided. A total of 14 teachers and 5 of school heads were interviewed. In each school, three teachers were interviewed. However, one of the interviews was interrupted because the interviewee's class was about to start.

I recruited a sample of teachers by asking for three volunteers to participate when visiting the staff room. I could have recruited more, as teachers were happy to do this. I felt by accessing the staffroom that I could access typical teachers with no special interest either way in Classera. Of course, their willingness to talk could indicate they might be more confident than other teachers in terms of using technologies, but from comparing the interview and survey data this did not seem to be the case. Most of the interviews lasted around40 minutes.

4.6.1.2 The first phase of the interview (interviewing Classera director)

The interview with the Classera director was conducted online over Skype, after an initial visit when I was in Saudi Arabia. The interview itself lasted around 55 minutes. According to O'Connor et al. (2008), adopting online research methods is valuable where it allows the researcher to complete the study in spite of distance between him or her and interviewees. Mertens (1998) suggested that appropriate time for the telephone interviews and the use of the online medium should be negotiated and agreed upon with the participants before

carrying out an interview. Additionally, participants should be informed at the beginning of the interview about the interview's purpose, a description of the questions and the confidentiality of data that will be gathered and whether a voice recorder was to be used for research purposes. In this study, all of these recommendations were considered and after gaining permission to record, the interview was carried out. I found the interview went very well and it felt comfortable talking through the Skype; clearly the participant was very used to talking through Skype due to the nature of her work. In establishing a rapport, it helped that I had already visited face-to-face.

The interview questions were divided into four main sections. The first part focused on general information about the programme, including who developed Classera, their reasons and aims, what other software the company was selling, the countries they were aiming to sell in and what future development they foresaw. The second section was focused on the benefits. Questions in this section included: 'What benefits are there for the learners'; Do you think the learners will find learning more fun using this programme; What does a teacher tell you are the benefits of using this programme?'. The third part dealt mainly with take up including: 'Are you especially interested in the school sector? Or higher education; Type and number of schools that are using Classera portal, to what extent the programme is being used in the schools that have adopted it?' The last section was focused on support. This covered the nature of training courses they offered for schools, the difficulties schools faced through taking up the use of the programme, the support schools received. I also asked permission to have help in finding schools in which to see Classera used (see appendix C).

I was aware that some of these questions may have been commercially sensitive. However, the Classera director also knew this and only spoke about plans in very general terms. I

gave a record of the interview back to the director for checking to see if there was anything she was not happy with. I felt that the director was trustworthy and did not try to praise her product over the other products. However, clearly she represented the commercial interests of the company.

4.6.1.3 The second phase of interviews (teacher interviews)

These interviews were conducted face-to-face when I was visiting Saudi Arabia. I felt the teachers would be more comfortable with face-to-face interactions, compared to the director, who was someone who worked in the technology and industry. Most of the interviews lasted around 45 minutes. I thought the interviews went well. I felt comfortable talking with the teachers and the teachers did not seem stressed or unhappy about taking part. They were not in a hurry to finish the interviews.

The interview schedule was divided into 12 themes. The first six parts covered: general information about the teachers themselves; their use of ICT and Classera; what they liked and disliked about Classera; their learners' use of Classera; their beliefs towards Classera use; their beliefs about teaching and learning. The next four sections focused on: their schools and the infrastructure of ICT in their schools; training courses they attended; ICT policies; the nature of leadership in their school. The final two sections concentrated on: opportunities and constraints teachers experienced while using Classera; their attitudes towards some of the culture beliefs as using internet in schools and communicating with learners at home through email and discussion board. Some prompting questions were added under each main section (four to five additional questions), in order to guide me if teachers did not have anything to say through the interview (see appendix D).

4.6.1.4 Third phase of the interview (headteacher interviews)

The interviews with headteachers were also face-to-face. The headteachers were open and responded in a candid manner to all of the question that I wanted to ask. However, I felt interviewing the headteachers was more stressful for me and that might have been because they were in important positions in the school hierarchy. The headteachers were very busy and although they gave me time they were interrupted by teachers with pressing questions. The interviews lasted around 30 minutes. The interview schedule was designed to cover: general information about their schools and why they thought to use VLE; what encouraged and discouraged the school; what were their goals and visions; what was the Ministry role towards VLE implementation in schools; their use of ICT and Classera; their beliefs toward leadership (see appendix B).

4.6.2 Observation

The literature on methodology showed that observation can be classified as quantitative or qualitative based on how the researchers structure their schedule. The observation would be qualitative if the researchers tended to record without following any particular schedule. This usually results in a narrative account of the behaviour (Bryman, 2001). Through analysing unstructured observation data, the researchers generate categories from the collected data rather than use concepts that were created from the beginning. In a quantitative observation schedule, on the other hand, the researcher follows a particular structure that is pre-established (Bryman, 2001). A structured observation schedule was more helpful for this study, mainly because I had a particular focus on how Classera was being used in the classroom. However, I included a space for open comments.

The schedule was divided into three parts. The first part covered the background information including school code, the date of observing the class, subject, lesson minutes and teacher nationality. The second part was focused mainly on the ICT infrastructure that

was available in the school and in the classroom. The third section covered the shape of the lessons looking at stages such as: starting by settling pupils and revising the previous lesson; introducing the lesson; showing and explaining the new learning; practicing and feedback; and finally a summary part. It also noted how much time was spent at each stage. The schedule also covered ICT tools and material that the teacher used during the lessons. I observed some group work activities and tasks that teachers gave to their learners (see appendix E).

A total of nine lessons were observed and each took about 45 minutes. Two classes from each selected school were observed, except that three classes from school C were observed. This extra class in C was because I was interested in finding out how the ICT teacher could use a computer lab without internet access. Only four of the participating schools gave permission to observe their classes. One school refused to allow observation, with the school principal explaining that even the parents were not allowed to enter the classes.

After completing the questionnaire in the staff room, I asked for two volunteers to participate in the observation and I took the first two teachers who volunteered**.** As I mentioned earlier in the interview section, these teachers may not have been a representative sample but the key for me was access. However, I afterwards felt these teachers were typical teachers in regard to lesson delivery and use of Classera. It was noticeable that all the observed lessons followed similar patterns. The teachers may have been more confident than other teachers in that they allowed me in the classroom, but they did not seem exceptional in terms of pedagogy or ICT use. In relation to their backgrounds, teachers were Saudi except for one, who came from Jordan. I confirmed to each of the teachers that the observed data would be used only for research purposes and

the teacher could withdraw at any stage during the lesson if she felt uncomfortable. I felt comfortable in the class and felt a rapport with the teachers. No unexpected issues rose.

4.6.3 **Survey**

Creswell (2009) defined the survey method as "a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population." (p.143). A survey gives you the overall picture in a short period of time. The survey approach was used because I had learnt after interviewing the Classera director that no usage, or other, data was available to me.

4.6.3.1 The design of the survey

A survey design goes through many processes. Hammond and Wellington (2012) point to the steps researchers need to go through while designing a survey. First of all, the topic should be selected and research questions formulated. Secondly, the researchers must define what information they need to investigate. Thirdly, they should decide what population will be involved in the study and how they choose the sample from the population. Then, the researchers should be able to design the instrument, pilot and revise it. After the reliability and validity of the instrument has been checked, the researcher can distribute and collect data from the target populations. Analysing and reporting are the final stages, where the researchers present and discuss the data they gained from the survey.

After choosing the topic and research questions of my project, an existing survey was adapted from Hammond, Reynolds and Ingram's study (2011). This survey concerned student teachers' use of ICT and was modified to address with the main aim of my research project. Some sections were added including demographics, teachers' personal use of Classera and training. Some other questions in the original survey were not relevant to the research project and were deleted. Additionally, many words in the adopted survey were

changed, notably from ‘ICT’ to ‘Classera’. After all these changes, the draft of the adapted questionnaire was reviewed to check content validity (see Cohen, 2007).

The questionnaire was piloted with some teachers I knew who were not participating in the full study in order to gauge if it was actually measuring what it was designed for. I discussed with my classmates from my bachelor’s degree about the purpose of the study and asked them to assess the clarity of the questionnaire content. A few changes were suggested and were taken into consideration. This stage helped me also to obtain face validity for the questionnaire (Cohen, et al, 2007). The final questionnaire was distributed in Arabic except in school E where an English version was available.

The survey was carried out in all five schools in the three different cities. According to Punch and Oancea (2014), informing respondents professionally and properly about purpose, the context of the research, what they are going to be asked, anonymity, confidentiality and the importance of their cooperation to the research encourages people to cooperate and so the quality of the data will be improved. I was given permission to give out the questionnaire while teachers congregated at the break time and were in the staff room together. Punch (2013) pointed out that “ it is unfortunate in research when an excellent job has been done of developing a data collection instrument, but the same thought and effort haven not been put in to the data collection procedure” (p.250). He suggested that researchers need to control the procedure of data collection by staying and administrating it face-to-face rather than leaving it to others. Thus, both processes are significant in determining the quality of the data (Punch, 2013). I agreed with Punch and I stayed with the teachers in each school while they filled in the questionnaire. In total, 91 secondary teachers completed the questionnaire, nearly all teachers (n=86) completed all the questions.

The questionnaire covered themes including: biographic details; teacher's personal use of Classera; access to Classera in school; support for using Classera; constraints on using Classera; use of ICT; attitudes to Classera; attitudes to professional development; general beliefs about teaching and learning (see appendix A).

Although, teachers were given the opportunity to write their personal comments, the questionnaire mostly consisted of closed questions, for example dichotomous questions (yes-no), rating scales, multiple choice questions. Dichotomous questions were used to ask about variables such as nationality, school type. According to Cohen, Manion, and Morrison (2013) asking respondents to make yes/no decisions might be inappropriate in some situations, where their complexity needs to be served through providing a range of responses to catch that complexity. For this reason, rating scales and multiple choice forms were used with more complex questions (see appendix A)

4.7 Data analysis procedure

I began by analysing the data of the interview with the Classera director before finalising and executing the other data collection tools for the reasons mentioned earlier. I transcribed the interview and read through it carefully. I looked explicitly to the response to each question but I did not formally code the transcript as it as a one off and being used for background understanding. I wrote a narrative account of the interview (see chapter two).

The questionnaires were analysed by using SPSS software. In terms of the questionnaire, I first looked at and analysed the data in general in order to get the main picture of Classera use in schools (see page 98). I next identified high and low use schools by looking at the ten statements that focused on the extent to which each teacher used Classera and how often they used functions such as uploading homework, quizzes (see Table 4 3). The data

showed that teachers in schools A and D had used Classera more frequently than teachers in schools B, C and E. In other words, in 8 out of 10 items teachers in A and D had proportionally the highest number, or second highest number of users, while schools B and E proportionally the lowest or second lowest. School C was more mixed on four out of ten occasions it ranked first or second in terms of use. In brief, A and D were identified as schools with the highest use and schools B and E with the lowest use. School C more closely resembled a high use school but not to the same degree as A and D (see Table 4-3). In addition I also looked at who were the highest users and who were the lowest users among the sample. I followed a similar procedure and took the ten statements and gave each teacher a score based on their level of use. I added the scores and was able to identify the highest quartile of teacher users and the lowest quartile of teacher users.

Table 4-2 Teachers' frequency use of Classera functions

Statement		A	B	C	D	E
Teachers who reported they uploaded quizzes in Classera	%	35	7	54	38	8
	Rank	3	4	1	2	5
Have you used Classera in your school?Who said yes?	%	94	82	100	92	87
	Rank	2	3	1	4	5
Teachers who used Classera frequently	%	100	55	73	79	64
	Rank	1	5	3	2	4
Teachers who reported they put their own presentation in Classera	%	80	25	45	69	29
	Rank	1	5	2	3	4
Teachers who reported they upload homework frequently (always or sometimes)	%	94	30	73	71	61
	Rank	1	5	2	3	4
Teachers who reported they upload monitor attendance frequently	%	94	30	73	71	61
	Rank	1	4	3	2	5
Teachers who reported they use communication tool frequently	%	25	40	18	38	27
	Rank	4	1	5	2	3
Teachers who reported they recorded lessons and uploaded it to Classera frequently	%	53	22	30	69	36
	Rank	2	5	4	1	3
Teachers who reported they uploaded videos to Classera frequently	%	100	72	73	83	69
	Rank	1	4	3	2	5
Teachers who reported they discussed with other school teachers through Classera library frequently	%	29	7	9	38	7
	Rank	2	5	3	1	4
Total rank scores		18	41	28	21	42

The interviews of both heads and teachers and observation data were coded manually. According to Lockyer (2004), coding in qualitative research is defined as the "systematic way in which to condense extensive data sets into smaller analysable units through the creation of categories and concepts derived from the data" (p.137). In the literature on analysing data, there are various approaches for coding qualitative data as a top-down or a deductive approach, involving the use of a coding protocol, which is then applied to units of meaning. Alternatively, researchers who are using an inductive or bottom-up approach need to read the interview transcripts and assign codes to units of meaning through how they could assign words or phrases.

In this study, coding was based on the 12 main themes in the interviews: teacher ICT use; their personal use of Classera; what they like and dislike about Claasera; their learners use; their beliefs toward Classera; their beliefs about teaching and learning; the ICT infrastructure in their school; training courses they received; their supervisors; the leadership in their school; the culture; the opportunities and constraints.

Each theme generated subthemes, (see appendix D). These subthemes emerged by looking, reading and re-reading the aggregated responses to each question. This was possible because the interviews followed a similar pattern, and teachers were quite happy answering questions in order. I coded a number and a letter for each teacher and school to help me distinguish between them and provide clearer pictures about teachers in different schools (A1, A2 and A3 for school A etc.). The structure of headteacher interview questions did not follow the same order as was the case for the teacher's interview questions.

The observation schedule was structured and organized under the main themes including teacher's background information, ICT infrastructure in the school and teacher's pedagogic practices. Each main part was focused on particular subthemes (see appendix E), which helped me to categorize all of the observation data in this regard. Then the qualitative and quantitative data were compared (see the following chapter) to check if both had comparable outcomes. Finally, both data sets were integrated in the discussion chapter in order to interpret the study as a whole.

4.8 Evaluation of the instruments

Validity and reliability are considered in the social sciences as the two main criteria used to evaluate quantitative research. In more detail, validity aims to assess content where it is further classified into internal and external validity. Internal validity is concerned with evaluating the causality in the relationship among variables and checking whether the

results that derive from such connections are valid or not. External validity, on the other hand, is focused on assessing whether research results could be generalized beyond a particular context. Reliability relates to the issue of whether the findings of a specific research study can be repeated. Lincoln and Guba (1985) pointed out trustworthiness as a criteria that is used for evaluating qualitative research. Although there are different classifications between qualitative and quantitative research in terms of evaluation, the criteria that are used for qualitative research run parallel with quantitative research evaluation criteria. In other words, credibility is the same as internal validity, transferability matches to external validity, conformality to objectivity and, finally, dependability to reliability.

Content validity was tested in both survey and case studies. I assessed all the instruments (survey, interviews and classroom observation) that were used in the study. As mentioned earlier, the interviews and questionnaire were reviewed by a number of people and their comments were taken in to account in the actual data collection instruments. This process aimed to ensure that all instruments would be understood by participants. Merriam (1998) proposed six different methods researcher could use to evaluate the internal validity of research data involving long-term observation at the research site, triangulation, member checks, peer examination, researcher's bias and collaborative modes of research. In this study, various data collection tools were used to enhance internal validity and to reduce bias and weaknesses that might be encountered by gathering data from one technique (see page 102 for more information). In other words, obtaining similar results from various sources greatly increases confidence in the validity of research data. In this study, the researcher's bias method was also used. I attempted to collect and analyse data impartially with clear and explicit explanations of the process provided.

Transferability was also enhanced through the use of various methods to collect the data, which helped to provide in-depth descriptions of the research contexts. Lincoln and Guba (1985) point out that reliability of data and findings could be assessed through the use of three techniques: investigator's position, audit trial and triangulation. The investigator's position means that the researcher should describe in detail the design, rationale and subjects of the study. The triangulation technique demands that the researcher involves different procedures and different sources. Finally, the audit trial method requires the researcher to describe in detail how the data were collected and analysed and how the conclusions were obtained. All of these techniques were considered, as discussed earlier in this chapter. According to Lincoln and Guba (1985), reliability could be obtained through gaining consistent and dependable data. This was also checked in this study through comparing the results obtained from the questionnaire with the results from interviews and observations, where all responses showed similar results.

4.9 Ethical issues

In the literature on ethical issues in the social sciences, there are four main criteria that researchers should considered before conducting a research project.

Informed Consent - Before collecting any data many steps were taken. First of all, I contacted the Classera Company, discussed the aim of the study and informed them that the study would not harm their business at any stage. Written consent was obtained from the Classera director to study the programme and to deal with the schools that were using it. Secondly, I contacted all of the five schools, explained the purpose of the study, and assured them about the anonymity of the data and confirmed that the data generated by them will be used only for research purposes. Formal consent from each school was obtained. I then sent the formal consents of the schools together with a brief introduction

of the study, research methodology, ethical considerations and timetable of dates needed in each region to the Saudi Ministry of Education, for permisison to proceed with the collection of the data. After obtaining a written consent from my sponsor, I submitted request to proceed with my upgraded proposal to the research ethics committee at the University of Warwick. After this step, the committee allowed me to take the research forward.

Harm to participants - Researchers should ensure that they are not going to harm the participants who take part either physically, emotionally or by putting them under stress. The participants might also be harmed by issues relating to the confidentiality of data. In this study, these two issues were considered. None of the instruments put the participants at risk where it investigated the nature of teachers' use of Classera and was concerned to find out the opportunities and obstacles that faced them. The data obtained from interviews and observations were taken with a particular care. Some of the interview questions required the teachers to engage in critical discussion about the nature of leadership in their school, school community and constraints faced them, the nature of supervision, which led to the researcher regularly assuring teachers as well as schools about the total anonymity of the data.

Privacy - Although it was explicitly stated at the beginning of the questionnaire that the information gathered by teachers would remain confidential, the researcher confirmed this directly while distributing it. The Classera director, school heads and teachers who took part in the interviews and classroom observations were also assured that their identities would not be identified. Throughout the data collection stages, the participants were given the opportunity to withdraw at any time should they feel uncomfortable and reminded of their right not to provide answers to any of the questions being asked.

Deception - This is mainly concerned with whether researchers investigate and measure what they stated and are supposed to measure. This study was concerned to investigate the use of Classera and to identify opportunities and constraints teachers faced while using the programme and the findings were obtained in this regard and matched the research objectives that had been set in the initial stage.

4.10 Summary

This chapter outlined the research design, methodology, strategies and data collection tools that have been used in the current study. A mixed methods approach was adopted in the study to exploit the strengths of two methods. This allowed me to understand more about school contexts and provided me with a general picture of the implementation of the Classera programme in schools, and what encouraged and discouraged teachers in using it. The triangulation of data collection tools that were adopted (survey, interviews, classroom observations) assisted me in obtaining a rich source of data and thereby increased the validity of the study. This chapter also highlighted briefly the approaches used to analyse the data collected and considered ethical issues.

Chapter 5 Analysis of the Quantitative data

5.1 Introduction

This chapter presents findings obtained from the questionnaire survey. A copy of the questionnaire is provided in Appendix A. As explained in Chapter 4, the data were gathered from five schools. In total, 91 secondary teachers completed the questionnaire, nearly all teachers (n=86) completed all the questions. Some questions were left blank by the remaining teachers. The data presented below cover all these respondents. The main aim of using a survey in my study was to get a general idea of the use of Classera and to gain perspectives on use. The questionnaire was divided into 12 themes and these are used to organise the findings:

Background information of teachers

Teachers' personal use of Classera

ICT infrastructure that was available

Classera use by learners and parents

Support teachers received while using Classera

The nature of Classera training workshops teachers attended

School environment

What gets in the way of using Classera

Students' use of ICT

Teachers' attitudes toward Classera

Teachers' attitudes toward their own learning and professional development

Teachers' beliefs about teaching and learning

Table 5-1 presents the total numbers of teachers who responded to the questionnaire in each school. As mentioned in Chapter 4, school B offered two different curriculums. The private section of this school followed the Ministry of Education curriculum, twenty teachers responded. In the international section, 13 teachers responded.

Table 5-1: Survey returns from the five schools

School Cases	School type	Questionnaire returns (n=)	Estimated teaching staff (n=)
School A	Private school	18	31
School B	Private school	20	27
	International school	13	15
	Total number	33	42
School C	Private school	11	14
School D	Private school	14	18
School E	International school	15	22

Responses were higher in school B, probably because it had two branches and the school was bigger. The responses varied from 11 to 20. In relation to the estimated number of teachers in the schools, the overall response rate was 72 %. It is very difficult to get people to respond to surveys and this response rate was, under the circumstances, good. I was allowed only restricted access to teachers. The headteachers in all schools explained that I could only access teachers who were in the staff room at a particular time, so I brought along my questionnaires, gave them out in the staff room and collected them after 20 minutes. I was able to clarify any of the problems the teachers had in filling them out. I then left. I considered the response rate was satisfactory. Of course, it would be better to have a higher response rate but I did not have access to all of the teachers in the school. I wanted to leave questionnaires for the other teachers but the headteachers would not let me. Social research is the art of the possible and I believed respondents were representative; I could see no reason why these teachers should differ from other teachers. When I looked at this later, I can see a broad range of opinions was expressed by the

respondents. My conclusion is that I cannot say with certainty that my survey gave a totally accurate representation of the teachers in the schools, but I believed that I managed to access the whole range of opinions and this was confirmed in the interviews.

5.2 **Background of teachers**

This section presents background information of respondents with regard to teaching experience, nationality and type of school. As we can see from Table 5-2, most of the participants (n=78) had 8 years or less teaching experience while only 13 teachers had taught for more than 9 years. Overseas teachers tended to be more experienced than Saudi teachers. This could be due to the employment patterns in public educational sectors in Saudi Arabia (see chapter one for more details). In brief, many teachers had to find jobs in the private sectors until they could obtain a public sector post. In terms of nationality, more than half of the teachers were Saudi, around a third were from different Arab countries (the most frequent of these nationalities were Jordanian and Egyptian). This breakdown between Saudi and non-Saudi teachers was expected and occurred mainly for the reasons mentioned earlier (see Table 5-2).

Table 5-2: Teaching experience of respondents broken down by nationality

Nationalities	Teaching experiences	N
Saudi	Fewer than 4 years	31
	4 to 8 years	23
	8 years or more	2
Total	All	56
Others	Fewer than4 years	12
	4 to 8 years	12
	8 years or more	11
Total	All	35

5.3 Teachers' personal use of Classera

In this first section, teachers were asked to provide detailed information about their personal use of Classera, with questions addressing such things as whether they had used similar packages before Classera, did they use Classera at school and how often and long had they been using it. Finally, some questions were asked about how often they downloaded Power point presentations, exams, assignments, attendance, lessons, videos and how often they communicated with learners and other teachers through Classera.

The data showed that most of the participants (n=67) had never used any other portal before, so that the use of a VLE was new in the Saudi school context. Given that private schools had a high status and were more often tempted to use technology, we could imagine the teachers in public schools would have less experiences of using Classera. Some teachers (n=23), though, had used a similar package to Classera. This might be because the Ministry of Education had introduced a programme called "Nour" and had encouraged teachers in all schools to upload assessment details on it. However, this system was very different (in its intentions) from Classera. One of these differences was that Nour was used only for administration work but not for communication. Although, Classera was new, the majority of the respondents (n=80) indicated that they had become Classera users. Only a few of them (n=10) did not use Classera. A further question found that 69% were using it either every day or two to three days per week. In contrast, 3% said they had never used Classera at all (see table 5-3). This was lower than 11% in the previous question and it might be that some people who answered no were in fact infrequent uses of Classera. Most teachers appeared to be active users. This suggests that schools were directed about teachers' use of Classera and/or teachers were accepting of its use. Most teachers had used

Classera for less than two years. This was to be expected given that Classera had only been recently introduced.

Table 5-3: Teachers' use of Classera (frequency)

Statements	Number of response/ items			
Have you used a similar package before starting with Classera?	Yes		No	
	23 (26%)		67 (74%)	
Have you used Classera in your school?	Yes		No	
	80 (88%)		10 (11%)	
If you answered Yes, How often do you use it?	Every day	Often (two or three days a week)	Sometimes (once a week)	Never
	30 (33%)	32 (36%)	22 (24%)	2 (3%)
How long have you been using it?	One-2 years	3-4 years	5 and more years	
	72 (80%)	13 (15%)	0	

Teachers were also asked to say which Classera functions they used. As we can see from Table 5-4, some functions were used more than others. The most used functions appeared to be related to the giving of information. For example, teachers uploaded homework, they put their own presentations up, uploaded videos (from interviews, these were understood to be YouTube clips). On the whole, they tended to upload material. However, far fewer people recorded lessons and uploaded them. In fact, teachers did not tend to record lessons very regularly, though a surprisingly large number (53%) did from time to time. In respect to quizzes, some teachers did upload them (from interviews it was discovered that these quizzes were within the system) but this was less popular. In respect to communications, the majority of teachers did use email or discussion boards to communicate with learners, though this was done less frequently than the uploading of information. Classera allowed discussion with other teachers in other schools and only the minority of teachers did this. This suggests that discussion with other teachers might be

more challenging. The recording of attendance was less popular and that might be because they were not required to do it and/or preferred to use a paper-based approach.

Table 5-4: Use of different Classera functions by frequency

Classera use	Always (Every day)	Often (2 or 3 days a week)	Sometimes (once a week)	Total number of teachers who use selected functions every week		Never
Upload videos or films	32	36	14	82	90%	4
Put your own presentations in Classera	9	29	32	70	77%	15
Upload homework in Classera	23	27	17	69	76%	17
Use email or discussion board to communicate with learners	6	21	27	54	60%	30
Record lessons and upload to Classera	17	16	15	48	53%	38
Upload quizzes in Classera	5	15	22	42	47%	40
Discuss with other school teachers through Classera's library	7	7	16	30	33%	55
Monitor attendance through Classera	11	7	12	30	33%	54

5.4 ICT infrastructure available in schools

In this section, the participants were asked to indicate which ICT tools were available in their schools. As we can see in Table 5-5, all the teachers agreed that they had interactive white boards, computers for learners and teachers to use, and computer labs. The availability of these ICT tools in all of the five schools was perhaps due to the requirements of Ministry of Education, which covered both private and international schools. (Although, international schools were teaching different curriculums, they should follow the requirements of Ministry of Education in regard to school infrastructures). However, the Ministry of Education did not require schools to provide internet access for teachers and learners and schools varied in this regard.

Table 5-5: The teachers' perspective on the provision of ICT tools in schools

Schools cases	Is there an IWB or other display device?	Are there computers for students to use?	Are there computers for teachers to use?	Is there a computer lab for students?	Does the lab have internet access?	do you have access to internet for all computers to use in teaching	Do learners bring in their own multimedia devices?	Do learners allowed to use internet at the school
School A	100	89	89	100	100	100	39	61
School B	91	91	100	97	97	91	37	64
School C	82	73	82	100	9	0	54	9
School D	100	86	100	100	100	100	100	100
School E	100	80	93	93	93	67	7	47
Total	94%	86%	94%	97%	85%	79%	44%	59%

As we can see in Table 5-5, schools A, B and D provided internet access in their computer lab, offered internet in classroom and allowed learners to have internet access. In contrast, all the teachers in School C agreed that they did not have internet access, neither in the computer lab nor in the classroom. School C differed because the computer lab did not have internet access, but a small number of teachers in this school thought learners could use their own devices. This might be because, as we can see later in my observations, teachers brought their own modem or brought a modem from the administration office to set up the internet access. In contrast, School E provided internet access in the computer lab and in the classroom for teachers to use in teaching. Learners were not allowed to use the internet. These differences between schools in terms of providing internet access for teachers and learners to use are probably based on school head's beliefs and policies about technology (see the interviews).

In brief, schools A and B were relatively open and had similar policies. Some of the teachers felt learners could bring their own devices to school and a majority felt learners were allowed to use the internet. School D was the most liberal and more open when it came to the use of internet. In different ways, school C and E were more restrictive. In

School C learners were not allowed to use internet in the school and in school E learners could not bring their own devices.

5.5 Classera use by learners and parents

In this section, the teachers were asked to comment on parents' and learners' use of Classera as this might helped reveal the constraints and opportunities faced by teachers. As for the learners (Table 5-6), we could see that all the teachers agreed that learners had individual log in access to Classera and the majority of the respondents also agreed that learners were able to use it at home. Most of the participants (n= 85) felt learners did access Classera at home. Interestingly, only six teachers reported that their learners were not using the portal at home. My assumption is that the teachers felt that all learners had access to the internet at home, because this would have been a normal assumption to make about children of Saudi middle-class families.

Table 5-6: Learners' access to Classera

Statements	Yes	No
Do people have individual log-in access?	91	0
Can learners access Classera from home?	87	3
In your experience, do learners access Classera from home?	85	6

As for the parents use of Classera, we can also see in Table 5-7 that more than half of the participants (n=64) agreed that parents had access to Classera, while only a few teachers (n=18) disagreed. Teachers reported different opinions towards parents' training courses. Some respondents (n=8) indicated that the school frequently provided workshops for parents in how to use Classera and more than a quarter (n=25) said that their school sometimes offered training courses. Eighteen of the respondents indicated that the school rarely provided workshops. In brief, we can conclude that more than half of the participants agreed that schools provided workshops for parents but they showed this

agreement to different degrees. School A offered the most consistent training, while, in contrast, the majority of teachers in School E and some from school C reported that their school had never provided training for the parents. In respect to providing guidance, most of the respondents (n=69) felt school offered guidance, while only a few teachers (n=15) disagreed. Through breaking down the data, I found most of the latter teachers were from School C while the majority of teachers in School A, B, D and E agreed. We could imagine that most of the schools were aware of the importance of involving parents given the conservative nature of Saudi society. Such involvement might help explain the high reported rate of learners use at home (n=85).

Table 5-7: Parents' access to Classera

Do parents have access to Classera?	Yes (%)	No (%)	No response (%)	
	64	18	18	
How often do school provides training courses for parents in how to use Classera portal?	Always (%)	Sometimes (%)	Rarely (%)	Never (%)
School A	38	44	6	12
School B	0	27	46	27
School C	0	36	18	46
School D	10	60	20	10
School E	8	17	17	58
Do the school sets clear guideline with parents about using portal with their children?	Yes (%)		No (%)	
School A	88		12	
School B	79		21	
School C	64		36	
School D	100		0	
School E	79		21	
Total	82%		18%	

5.6 Support

In this section the teachers were asked to indicate to what extent they received support from Classera representatives, their supervisor, other school leaders, the school principal,

manuals/online resources, their colleagues, ICT teachers and pupils. As we can see in Table 5-8, the most frequently cited source of help was Classera representatives. More than half of the respondents claimed that they had also received support from their supervisors, school heads, ICT teachers, other school leaders and from manuals or online resources. However, only 40% of the teachers asked for help from their learners. The data gives an indication that teachers received a mix of external and internal support to use Classera.

Table 5-8 is interesting because it breaks down responses by school. School A, which seemed to make most use of Classera, is characterized by an exceptionally high rate of support both by Classera representatives, school principal and by supervisors. In school C, only 18% of teachers found support from the supervisors. Likewise, in School E, only 38% of the teachers found support from the school principal. This is significant as the head teacher is a key person in the promotion of Classera. In School B, overall support seemed low.

Table 5-8: Types of help received by teachers

To what extent have you received help from the following when using Classera in school	School A	School B	School C	School D	School E	Total
Classera representatives	100	50	91	79	80	74%
Other school leaders	81	59	64	67	46	63%
ICT teacher	62	63	64	50	77	63%
School principal	88	48	64	73	38	60%
Manuals / online resources	59	43	54	50	46	49%
Pupils	59	25	45	42	42	40%
Your supervisor	88	52	18	50	73	58%

5.7 Training

In this section, the teachers were asked to indicate their experiences of training they had received in terms of Classera use. As we can see in Table 5-9, almost all the teachers (n=85) had received training workshops in how to use Classera, only four teachers had not. More than half of the teachers (n=58) received one to two workshops about Classera while

quarter of the respondents (n= 25) attended three to five sessions. Only three teachers received more than six workshops. In terms of the benefits, the majority of the teachers reported that workshops were sufficient, included a hands-on element, were comprehensive, addressed their needs and focused on developing teaching and their IT skills. Only one teacher strongly disagreed. More than half of the respondents (n=52) had never observed other teachers using Classera. In general, this gives an indication that Classera was relatively straightforward to learn to use both in terms of IT skills and in terms of concept. In School B, there was a particular issue in that 13 of the teachers said the training was not sufficient. This data is consistent with previous data where teachers in this school said they had less support from Classera representatives. No teachers in school C reported any of these issues.

Table 5-9: Teachers' views of the provision of training for using Classera

Statements	Number of responses						
Have you ever taken training courses at how to use Classera portal?	Yes	No	The schools of the teachers who said no to this question				
	85	4	School A 1	School D 1	School E 2		
Who has carried out the training?	School	Classera	Ministry of education	School and Classera			
	48	14	1	23			
How many training sessions did you receive in using Classera?	1-2 sessions	3-5 sessions	6 or more sessions	Never received any training courses			
	58	25	3	4			
Have you found the training sufficient?	Yes	No	The schools of the teachers who said no to this question				
	71	17	School A 1	School B 13	School C 0	School D 1	School E 2
	Yes					No	
Has the training included a hands on element?	80					7	
Have you ever observed other teachers using Classera?	37					52	
Has the training addressed your needs?	66					21	
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree		
The training has been helpful	33	42	10	5	0		
The training has been comprehensive	33	30	17	10	0		
The training has focused on developing teaching as well as IT skills	30	33	16	9	1 (School D)		

5.8 Environment

In this section, the teachers were asked to indicate to what extent school teachers, school heads and other school principals were enthusiastic towards Classera use. Interestingly, most of teachers across the five schools (72%, see

Table 5-10) were enthusiastic towards using Classera and only some teachers (26%) reported that a few of their colleagues were not interested in using it. Only two teachers across the five schools felt that none of their school teachers' colleagues were enthusiastic. In this case, School B and E come out as being less enthusiastic.

Table 5-10: Teachers reviews on the enthusiasm of colleagues

What proportion of teachers at your school would you say are enthusiastic towards using Classera in delivering the school curriculum?	All	Most	Few	None
School A	8	7	3	0
School B	3	20	9	0
School C	0	10	0	1
School D	2	8	3	1
School E	1	6	8	0
Total	72%		26%	2%

We could conclude that Classera seemed to be accepted among most of the teachers in all of the five schools. In terms of school leadership, almost all the teachers reported enthusiasm for using Classera. In contrast, only two teachers indicated that their heads had not been enthusiastic at all. Again, teachers in schools B and E saw less enthusiasm (see Table 5-11).

Table 5-11: Teachers views on of the enthusiasm of school leadership (reported as numbers)

How enthusiastic you say the principal and other school leaders in your school are like Classera?	Very enthusiastic	Somewhat Enthusiastic	Slightly Enthusiastic	Not at all
School A	17	1	0	0
School B	18	11	2	1
School C	8	3	0	0
School D	11	3	0	0
School E	8	5	1	1
Total	95%		3%	2%

5.9 What gets in the way of using Classera?

This section of the questionnaire examined the participants' views about constraints on Classera use, looking at teachers beliefs towards using Classera, teachers' ICT skills, availability of internet access at schools and learners. An open-ended question was provided in order to allow teachers to mention other constraints (see Table 5-12).

Table 5-12: Constraints on using Classera

Response	School A		School B		School C		School D		School E		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
The learners don't like using Classera	7	39	5	16	10	91	1	7	2	13	25	32
I find Classera difficult to access in my school	5	28	15	47	9	82	1	7	7	47	37	41
I don't think using Classera is time effective	3	22	1	6	3	27	1	7	3	20	11	12
I don't feel confident using Classera in my lessons	3	17	3	9	1	9	1	7	2	20	10	11
I don't think Classera benefits learners	3	17	2	6	3	27	1	7	1	7	10	11
I find Classera difficult to use	2	11	2	6	0	0	1	7	3	20	8	9
I don't know how to use Classera	2	11	0	0	0	0	0	0	0	0	2	2
I don't know where to find Classera	1	6	0	0	0	0	0	0	1	7	2	2

On the whole most teachers had positive experiences and did not agree with the statements offered in the questionnaire. This is a general picture, but there were two questions where the responses stand out: "I find Classera difficult to access in my school" and "The learners don't like using Classera". This was in school C where the very large majority of teachers found Classera was difficult to access and believed that learners did not like using Classera. Although, there was high use in School A, some teachers too believed the learners did not like to use it. In School B and School E it seemed that Classera was difficult to access.

Through open ended questioning, one teacher from school A mentioned that some lessons could be helped by Classera while others could not. In School B, four teachers found the availability and the speed of the internet at school constrained their use and one teacher mentioned the lack of internet access at home. One teacher also found that an overload of teaching could restrict them and learners already had too many tasks they should do in their

books. Another teacher in school B mentioned that she did not know how to activate the discussion board. All of the three teachers in school C mentioned that learners did not usually have internet access at school. In school D, one teacher mentioned that some learners did not have internet access at home. Finally, one teacher in school E indicated that some learners were not interested in using Classera.

5.10 Student opportunities to use ICT

In this section teachers were asked to indicate to what extent they gave their students the opportunity to use ICT, such as using the internet, creating products with the computer, communicating through emails and discussion boards, and the opportunity to play computer games.

As we can see in Table 5-13, most teachers encouraged their students to use the internet (n=71) and create products through the computer such as texts or presentations (n=61). In the case of school C all the teachers agreed this was so. This gives an indication that teachers were interested in using ICT and believed in its positive impact on their pupils. However, less than half of the teachers (n=39) allowed their learners to use communication activities such as emails and discussion boards and relatively few teachers (n=29) gave their learners the opportunity to play a computer game. This might be because some teachers may believe that they could communicate with their learners through the school day and had no need to use electronic media. In regard to computer games, we could imagine that there was not time in lessons for their pupils to play such games.

Table 5-13: Students opportunity to use ICT in school

Response	School A		School B		School C		School D		School E		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Use the Internet?	14	78	25	78	10	91	12	86	10	67	71	78
Create products with the computer such as texts, or presentations?	9	50	19	59	11	100	11	79	11	67	61	67
Use email or discussion forums?	8	44	14	44	4	36	8	57	5	33	39	43
Play a computer game	9	50	7	22	1	9	8	57	4	27	29	32

5.11 Attitudes to Classera

In this section, teachers were asked about their attitudes toward Classera use. Ten of these questions invited agreement if positive about Classera but two were expressed negatively so if respondents were positive they would have to disagree (Table 5-14). It is important to recognize in this table that all of the teachers signalled agreement that Classera was useful and could be used. The large majority believed that Classera made learning more effective. In trying to understand why teachers did use Classera, this statement is particularly important. All of the following statements triggered positive responses: Classera helped in assessment; pupils enjoy lessons more when they use Classera than when they don't; Classera is particularly useful in helping me to support the diverse learning needs of pupils; using Classera in my teaching saves me time; Classera can help in giving individualised feedback to pupils; and Classera helps attainment. There were limits on Classera's usefulness and some agreed that: it is difficult to find the time to try out Classera; Classera is not relevant for every subject; it is easier to find relevant teaching materials in textbooks than on the internet.

Table 5-14: Teachers' attitudes about Classera

Statements	Strongly agree	Agree	Total of agreements (%)	Neither agree nor disagree	Disagree	Strongly disagree	Total of disagreements (%)
Classera makes learning more effective.	29	44	73 (80)	11	5	1	6 (7)
Classera can help in giving individualised feedback to pupils.	20	43	63 (69)	18	4	2	6 (7)
Classera helps attainment.	20	35	55 (60)	19	9	3	12 (13)
Classera helps me to use a wider range of assessment tasks.	18	34	52 (57)	26	4	3	7 (8)
Using Classera in my teaching saves me time.	10	32	42 (46)	27	15	5	20 (22)
Classera is particularly useful in helping me to support the diverse learning needs of pupils.	12	29	41 (45)	29	13	3	16 (18)
Classera is particularly useful in helping me to support the diverse learning needs of pupils.	12	29	41 (45)	29	13	3	16 (18)
Pupils enjoy lessons more when they use Classera than when they don't.	11	29	40 (44)	34	10	4	14 (15)
Pupils enjoy lessons more when they use Classera than when they don't.	11	29	40 (44)	34	10	4	14 (15)
It is difficult to find the time to try out Classera	9	17	26 (29)	22	29	12	41 (45)
Classera is not relevant for every subject.	6	12	18 (20)	22	30	17	47 (52)
It is easier to find relevant teaching materials in textbooks than on the internet.	6	19	25 (27)	18	28	16	44 (48)

In this part, teachers were asked to indicate their self-efficacy in respect to the use of Classera in teaching and learning. Interestingly, as we can see in Table 5-15, most of the teachers (n=62) indicated that they had a high degree of confidence in their ability to use Classera and a strong feeling of self-efficacy. This is particularly marked in Schools A and B. This was probably due to the help teachers received from different sources: Classera itself, colleagues, heads and resources (for more information see the support section). A few teachers (n=24) felt less self-efficacy and this was more noticeable in Schools C and E. This might be due lack of support (see the support section for more information).

Table 5-15: Teachers' sense of self-efficacy in respect to the use of Classera

How effective do you feel you are in using Classera to support learning and teaching in the classroom?	Not effective at all	Not very effective	Total of not effective (%)	Quite effective	Very effective	Total of effective (%)
School A	1	3	4 (23)	5	8	13 (72)
School B	1	6	7 (22)	13	11	24 (73)
School C	0	4	4 (37)	4	3	7 (64)
School D	1	2	3 (22)	3	6	9 (65)
School E	1	5	6 (40)	7	2	9 (60)
Total	4	20	24 (26)	32	30	62 (73)

5.12 Attitudes to teachers' professional development

In this section, the teachers were asked to indicate their attitudes about their own learning and professional development. Summarizing the data in Table 5-16 gives the impression that teachers were interested in developing themselves professionally because they would try to follow the advice from more experienced people and to attend in-service events. However, teachers were generally cautious in trying out new approaches.

Table 5-16: Teachers' attitudes about their professional learning

To what extent each of the statements below corresponds with your attitudes and behaviours?	Most or Somewhat like me	%
I tend to follow the advice I am given by people more experienced than me.	85	92%
I will not try something out unless I am fairly sure it will work.	61	68%
I am willing to try out new things even if this means taking a few risks.	54	60%
I try to attend school in service events offered in school	79	87%

5.13 Beliefs about teaching and learning

In this section, teachers were asked to indicate their general beliefs about teaching and learning. Interestingly, only three teachers from all the five schools indicated that they agreed with the statement that 'Instruction should start with teacher modelling and guided practice followed by practice and review'. In contrast, 29 teachers believed that instruction should be organized around meaningful activities and projects, while the majority of the respondents (n=57) lay between these two statements. This gives an indication that most of the teachers had balanced views of pedagogy and largely disagreed with didactic teaching (see Table 5-17).

Table 5-17: Teachers believes about pedagogy (who said exactly or somewhat like what they believe)

Which statement is closest to what you believe?	Responses	
	N	%
Instruction should start with teacher modelling and guided practice followed by practice and review.	3	3.3
Balanced between these beliefs	57	63.3
Instruction should be organized around meaningful activities and projects	29	32.2

Again, most of the teachers' responses (n=64) lay between feeling responsible for working out for themselves how best to teach their classes and taking the advice from more experienced colleagues. In general, we could see that that majority of the teachers believed they should develop their own learning but also seek help at times (see Table 5-18).

Table 5-18: Teachers' attitudes to professional learning (who said exactly or somewhat like what they believe)

Which statement is closest to what you believe?	Responses	
	N	%
It is my responsibility to work out for myself how best to teach my class	24	27
Balanced between these beliefs	64	71
It is my responsibility to take the advice of more experienced colleagues	1	1

Interestingly, no teachers believed they should only rely on routines in developing their teaching with most of them (n=53) believing that it was important to try new things out. 36 teachers were balanced between these two statements. Again, this gives an indication that teachers were not wedded to traditional teaching methods but they were receptive to developing their teaching through using different teaching methods (see Table 5-19). We can conclude from these three tables that teachers believed it was professionally appropriate to take on new tools and wanted to use them.

Table 5-19: Teachers' attitudes towards change (who said exactly or somewhat)

Which statement is closest to what you believe?	Responses	
	N	%
It is important to try new things out all the time in my teaching.	53	59
Balanced between these beliefs	36	40
It is important for me to develop routines.	0	0

5.14 Summary of the findings

All the teachers were female and most had 8 years or less teaching experience.

About their use of Classera

Most of the participants had not used a portal before Classera

Most now used Classera

The majority were using Classera every day or two to three days per week

Most had been using Classera for less than two years

The most used functions were uploading videos, homework and uploading their own presentations. Quizzes, communications, and recording lessons were less popular

Discussion with other teachers and attendance monitor were least popular.

About ICT tools in the schools

All had interactive white boards, computers for learners and teachers to use and a computer lab. The schools differed in terms of providing internet access for teachers and learners to use and in allowing learners to bring their own devices

About learners and parents

All agreed that learners had individual log-in access to Classera and the majority felt parents had access to Classera too

Most agreed that learners were able to use Classera at home and most felt that learners did access it

The majority felt that their schools were providing workshops for parents about Classera but to different degrees

About their skills to use Classera

Most had a high degree of confidence in their ability to use Classera and a strong feeling of self-efficacy

About support for using Classera

Most cited Classera representatives as a source of help, other source of help in order of importance were ICT teachers, other school leaders, their supervisors, their school heads, manuals or online resources and finally learners

Almost all the teachers had received training workshops in how to use Classera, some had attended more sessions that others

Most found workshops included a hands-on element, were comprehensive and addressed their needs

Nearly all found their colleagues were enthusiastic about using Classera, though a small number disagreed

They found school heads and other school principals were enthusiastic toward Classera but again a small number disagreed

What gets in the way of using Classera

Most teachers had positive experiences and did not encounter big obstacles

Some teachers felt Classera was difficult to access in their school and learners did not like using Classera

About the use of ICT with their learners

Most encouraged their pupils to use the internet and create products through the computer but only some teachers encouraged communication activities or gave their learners the opportunity to play a computer game

Some were interested in using ICT tools and found it easier to find relevant teaching materials on the internet than from textbooks

Attitudes towards Classera

All signalled agreement that Claasera was useful and should be used. Most believed that Classera made learning more effective and they felt Classera helped learning in different areas that was less strongly expressed but still seemed very positive

What the teachers had said in the survey about to whom they would turn to improve their teaching:

Most would turn to their colleagues, supervisors and only some would turn to learners and their school heads

What the teachers said in the survey about their own learning and professional development

Most were interested in developing themselves professionally and would follow the advice from more experienced people and try to attend in service events.
However, there were limits on risk taking and innovation

Beliefs about teaching and learning

There were mixed views on pedagogy and their responsibility for how best they teach their classes but a majority believed it was important to try new things out.

5.15 Differences between teachers and schools and their use of Classera

As mentioned earlier in the methodology chapter (see page 112), schools A and D were the schools with highest use of Classera and with proportionally the largest number of high users. Schools B and E were lowest use of Classera and with proportionally the smallest number of high users. I became interested in exploring what was different about these types of schools that might influence high use and low use in relation to: nationality; teaching experiences; length of period of using Classera; enthusiasm of school leaders and colleagues; parents' access and training; support received from school heads and colleagues; and teachers' training.

Nationality and teaching experiences

As regards high users, after I identified high and low use schools by looking at the ten statements (see page 112 for more information), I then looked at how many of these high teachers were Saudi and found that 37% of Saudi teachers were high users. While 26% of the other nationalies were high users. We can see that high users were more likely to be Saudi than of other nationality and more likely to have more than four years' experience (see Table 5-20). We more often imagine that younger people are more into technology than older people. However, this was not the case in my study. The most likely explanation seems to be that when teachers get more experience they establish routines and sometimes find it easy to find time to take on new things. I can see no reason why Saudi teachers should be higher users than non-Saudi teachers. As regards lower users, these were more likely to have fewer than four years of teaching.

Table 5-20: High and low users by nationality and experience

Nationality and teaching experiences	Total number	High users	%	Low users	%
Saudi teachers	56	21	37	12	22
Other teachers	35	9	26	7	20
Fewer than 4 years of teaching	43	12	28	13	30
More than 4 years of experience	48	18	38	6	13

I then took some of the items within the survey and broke down responses by higher and lower use schools. These items covered the length period of using Classera, which was in the personal use of Classera section in the questionnaire; enthusiasm of school leaders and colleagues, which was in the environment section; parents' access and training, which was in the learners and parents' access section; support received from school heads and colleagues, which was in the support section; and finally teachers' training, which was in the training section. I then explored the rank order of each school in relation to each item. I ranked 1 for the school with the highest percentage of high users and 4 for the school with the lowest percentage of high users. I then calculated a final rank score for each school. As in the example of parental access and encouragement below (see Table 5-21). School C has been excluded here mainly because it showed shared characteristics among highest and lowest schools.

Table 5-21: Total rank score for parents' access and training

Statements		A	B	D	E
The teachers who agreed that the parents had access to Classera	%	81	50	100	87
	Rank	3	4	1	2
The teachers who agreed their school sets clear guideline with parents about using portal with their children?	%	87	79	100	79
	Rank	2	3	1	3
The teachers who agreed that their school provided training courses for parents frequently in how to use Classera portal (who said always and sometimes)	%	81	27	70	25
	Rank	1	3	2	4
Total Rank scores		6	10	4	9
position		2	4	1	3

I then did the same for length period of using Classera, teachers' training, support, enthusiasm of school leaders and colleagues themes (see Table 5-22).

Table 5-22: Total rank scores for other main themes

Total rank scores for main themes	School A	School B	School D	School E
Parents' access and training	2	3	1	4
Support received from school heads and colleagues	1	3	2	4
Teachers' training	1	4	2	3
Enthusiasm of school leaders and colleagues	1	3	2	4
The length of using Classera (How many teachers had used Classera for more than three years?)	2	3	1	4

In brief, school A and D showed better support from their colleagues and school heads, more enthusiasm for Classera, and better training for parents. Their teachers were happier about the nature of the training and had used Classera for longer period of time.

5.16 Summary

We found that the help that teachers received from their colleagues and school heads, the enthusiasm of the school faculty to use Classera and the support that the parents received through training and long period of using the system and the training assisted the teachers in school A and D to use Classera more frequently than other teachers in schools B and E.

Chapter 6 Analysis of the Qualitative Data: head and teachers interview transcripts)

6.1 Introduction

In this chapter the data from the interviews for both teachers and heads and observation data are analysed and illustrated. The chapter begins with the analysis of the teachers' interviews and is then followed by the headteachers' ones. The chapter then ends with the analysis of the observation data. As explained in chapter 4, the interview data was gathered from five schools. In total, 14 teachers participated in the interview and five of the headteachers. Three teachers participated from four of the schools, but school E allowed only two teachers to participate. Most of teachers' interviews took 45 minutes, while those with heads lasted 30 minutes. In regard to the observed classes, only four schools were observed. A total of 9 lessons were observed and each took about 45 minutes. Two classes from each selected school were observed, except that three classes from school C were observed. However, as discussed in chapter 4, no classes were observed in school E. The interviews and observations were used together with the questionnaire in order to uncover attitudes and behaviour in respect to Classera.

The interview schedule for the teacher was divided into 11 themes as follows:

Teachers general use of ICT

Teachers' beliefs towards using ICT in their teaching

Teachers' use of Classera

Learners' use of Classera: what they liked

Teachers' beliefs about parents' use of Classera

Teachers' beliefs about teaching and learning.

ICT infrastructure

Training

Supervisors

School heads

Opportunities and constraints teachers experienced while using Classera

The interview schedule for the headteacher was categorized into 6 themes as follows:

general use of ICT

attitudes towards the integration of Classera portal in their schools

attitudes towards teachers' use of Classera

attitudes towards providing internet access for learners to use in their schools

attitudes towards the Ministry of Education in regard to ICT use

attitudes toward parents in regard to Classera use

The observation schedule for the teachers was divided into four parts including:

Background information

ICT infrastructure that was available in the school and in the classroom

The shape of the lessons and time spent at each stage

ICT tools, activities and material that the teacher used during the lessons

6.2 The interview schedule for teachers

6.2.1 Teachers' general use of ICT

This main theme was categorized under three main subthemes: the use of ICT in teachers' daily life, teacher use of ICT in their teaching; and teachers' beliefs towards ICT in teaching. Each of these will be discussed in detail in the following sections.

The use of ICT in teachers' daily life

All of the teachers agreed that they used ICT every day for personal use. Three teachers had more extended use, two for professional development (C2 and E1) and one who frequently watched films online (A2). However, the biggest use of ICT was for social media and they gave examples of using social media for communicating, updating their friends on what they were doing and making arrangements. Twitter, Facebook and WhatsApp were used by all of the teachers. None of the teachers said they had never used ICT.

This gives an indication that ICT plays a role in teachers' daily life and these teachers were probably similar to most adult people in Saudi Arabia, who use social media regularly. An implication of that experience might be that teachers were willing to accept Classera in their professional lives or at least not feel intimidated by the technology. One teacher said: "*I was worried about anything new with technology but after engaging with computers for myself I like to experiment with new things."* (B2).

The teachers use of ICT in teaching

All the teachers used ICT in their teaching. The responses concerning the ways of using ICT in teaching are grouped into four subthemes: **searching for resources; letting pupils use iPad; using specific hardware** and **software;** and **displaying** (see Table 6-1). Some

teachers mentioned they did all of these things while others concentrated only on one, two or three things. None of them said they had never used ICT while teaching.

Table 6-1: The ways teachers used ICT in their teaching

The ways teachers used ICT in teaching	Searching the internet for resources	Letting pupils use iPad	Using specific hardware and software	Displaying Content
School A	2	2	3	3
School B	2	1	2	3
School C	1	1	0	3
School D	2	2	2	3
School E	1	0	0	2
Total	8/14	6/14	7/14	14/14

All the teachers across all five schools gave examples of **displaying content** – this was the most frequently cited use. They gave examples of displaying Power Points, showing YouTube video clips, showing pictures to talk about in front of the class. For example, one teacher said: "*the learners will get bored if we just elaborate the content to them. So I like to give some of the visual things like showing them a lot of pictures and videos, to help them be interested in the content and surely it will be better than verbal*." (E1). One reason put forward about why they used ICT was that it was one of the requirements of the Ministry of Education. As one teacher explained: "*using the projector during the lesson is one point of the supervisor check so if I have not used it, it will effect on my evaluation.*" (A2). This will be looked at in more detail later.

8 out of 14 teachers from all schools gave examples of **searching the internet for resources.** Some of these examples concerned access to resources that would help in preparation for teaching, for example accessing video clips for learners to view or accessing TESOL lessons on YouTube. As one teacher said: "*math has a different way of teaching and so I usually watch many YouTube clips before planning the lesson. This shows different teaching strategies to help me find the easiest way that I can use with my learners who have different learning styles"* (C2). Another use for searching the internet was when teachers helped learners to search for their own resources; as one teacher highlighted: *"I ask the learners at the end of the lesson to*

search at home for a particular thing that is related to the lesson and to bring it next day to discuss it together" (A2).

Some teachers gave examples of specific **hardware and software** including the multiple mouse, electronic scanning, recording (in this case giving a voice to a puppet to tell a story), using 3D and using a document camera. These examples, however, only came from schools A, B and D. The reason seemed to be that they had received more opportunities via ICT workshops and access to such tools in their school than in schools C and E. As one teacher said: "*the training workshops the school offered helped me not only to use different educational hardware and software but also in how to integrate it in my teaching.*" Another teacher said: "*the school provides 3D and Documentary camera and other ICT tools to be used while teaching."* (D3).

Some teachers gave examples about **Letting pupils use iPads** and these teachers were from School A, B, C and D. They agreed that they needed to get permission from the school administration before asking the learners to bring their own iPad and they needed to collect it from the pupils at the end of their lesson. Although, these teachers asked their learners to bring their own iPad, they were different levels of flexibility in school policy. The iPad was most used in school A and D where the principal was relatively open; one teacher said: "*I ask the learners to bring their own iPad every day*." (A1). In contrast, one teacher in school C explained: "*I used iPad once with my learners and I will never do it again as I found it a big responsibility on my shoulders. I collected the devices from the learners early morning and gave them to the administration office and I wrote a code in each of them and took it back before the start of the lesson. I gathered them at the end and again I gave them to the learners at the end of the day. I think it might be much easier if the school just provide us one iPad for each class and allowed the teacher to use it with their learners."* (C2).

Teachers' beliefs towards using ICT in their teaching

This main theme is grouped into: teachers beliefs toward ICT use in general and teachers beliefs towards the specific use of communications tools with the learners. This will be discussed in more detail in the following sections.

Teachers beliefs towards general ICT use

Teachers were asked if their use of ICT helped them or not. All the teachers felt positively about the use of ICT and believed that ICT was important in their teaching. None of the teachers had a negative belief in this regard. However, there was general agreement among teachers that ICT could not be used every day with every lesson. An example of this was a teacher who explained: "*I used ICT every week but not every day as some lessons required me to use different technique, so it depends on the nature of the lesson.*''(D3).

The advantages teachers saw in using ICT were coded into three subthemes. These were **developing learners' ICT skills; enhancing teaching;** and **motivating learners** (see Table 6-2).

Table 6-2: the advantages teachers found from using ICT in teaching

The advantages teachers saw in using ICT		
Developing students' ICT skills	Enhancing teaching	motivating learners
1	5	7

Some teachers saw ICT as **motivating learners** and this was the most cited aspect. One teacher said: "*a few years ago, my clothes was messy with chalk dust and I believed at that time that I had delivered the knowledge in a perfect way. But now everything is changed and I start noticing that with showing videos or pictures it makes learning and pupils more effective and breaks the routine of the lesson. The new generation of the learners cannot concentrate more than 20 minutes without you getting their attention. Therefore, using technology is one of the technique that I used to get learners attentions.*" (B 2). Another teacher added: "*one of the teacher's role is to encourage learners to learn and using these ICT*

tools is considered as one of the ways to encourage them." (B3). Some teachers believed learners had different learning styles and ICT helped pupils to tailor their learning to what best suited them. As one teacher said: "*there are some learners who acquire knowledge easier through the use of ICT and this depends on their learning styles*." (C2)

Five teachers found ICT helped them to **enhance teaching,** for example it made the content clearer and allowed multimedia. One teacher said: "*the use of ICT helped me to use different resources as videos, picture and power point to deliver the knowledge in different ways."* (E2). Other teachers found ICT helped expand the limits of the curriculum. One teacher explained*: "the learners are much more aware of everything than previous generations where some learners may ask me questions that I have no idea about it but the use of ICT helps me to get a quick answer, so we can discuss in the next lesson."* (D3*)*

Finally, only one teacher believed that ICT helped to **develop students' ICT skills**. As she highlighted: "*letting my learners to use iPad during the lesson gives me the opportunity to teach them how to search quickly and find information from reliable sites rather than leaving them to search for it alone at home or asking another member of the family to do it*." (A1). In summary, all the teachers were positive in principle about ICT use, although in practice, use was varied and affected by conditions in different schools.

Teachers beliefs towards the use of communications tools with the learners

This main subheading was coded into positive and negative. Although ICT is sometimes seen as undermining teachers, the teachers in this study were quite relaxed about tools which reduced the hierarchy between teachers and learners. The majority of the teachers shared similar ideas about communication with learners through Classera. They were relaxed about email and did not see this is as undermining the status. Only one teacher

from school A had a negative view in this regard as she explained: *"we should use emails and discussion board in different times because using it every day might break the barrier between us."* (A2).

6.2.2 **Teachers' use of Classera**

In respect to the functionality of Classera, all of the teachers mentioned they used the **Course material, Video Lectures, Homework** and **Exams** functions regularly and more than others (see Table 6-3 and also Chapter two for more information what these functions cover). For example, within the Course material area, all teachers uploaded at times PowerPoint and hand-outs. The video lectures function enables teachers to film their lessons and upload videos from YouTube clips. However, all the teachers said they uploaded videos from YouTube while none of them had filmed their classes. In the homework area, teachers would create questions and set a submission date, while in the Exam area, tests are timed. Course material, Video Lectures, Homework and Exams were more popular as one teacher said: *"I usually upload PowerPoint, Videos and create Tests and Assignments. But I do not have enough time to activate the virtual Classes with my learners."* (C3). None of them had never used such functions.

Table 6-3: The number of the teachers who used Classera functions

What teachers used in Classera							
Homework and Exams	Course material	Video Lectures	Communication (Discussion board and Emails)	Virtual classes	Classera's library	Attendance Logs	Analytics
14	14	14	7	4 (A2, B1, B2, D1)	2 (D3, C2)	2 (C2, D1)	1 (D1)

Around half of the teachers used **communication** via Classera, i.e. the email and discussion board. As one teachers said: "*I communicate with the learners and parents as a lot of parents use Classera rather than come to the school."* (E2).

Only four teachers used **virtual classes** with their learners. One teacher was particularly committed. She would log on to give extra support outside of the classroom; as she said: "*I use virtual classes more often not to teach new lesson but to provide extra help for learners who need support.*" (B2).

Only five teachers mentioned they used other functionalities: **Classera's library, analytics** and **attendance logs.** Two teachers used the library with other school teachers. For example, they posted some lesson plans, some resources and then they took them from other people as well. Two other teachers used attendance logs as recorded evidence of presence. One teacher highlighted that this enabled them to give immediate feedback through emailing parents about attendance and said: "*I use attendance through Classera to inform parents about their child's absence and this makes learners keener to attend my classes.*" (C2). Although, one teacher used the analytics function, in practice she only used it for looking at which learners did their homework.

Overall, the functions were used to varying in degrees, Course material, Video Lectures, Homework and Exams the most popular and other things, such as the library, used less. Some teachers mentioned things that they explicitly did not use. This included **Virtual classes** and the reason why they said this was because they did not have the time; one teacher said: *"I do not use the virtual classes because the limitation of my time as I am teaching new subject but I find uploading homework and videos a bit easier and does not take time to do it."* (C3). Another teacher in school C said she could not find an appropriate time that suited them and their learners. However, a teacher in school E said: *"I have not used virtual Classes as we have problem in between because of the construction but once it is solved we will start using it."* (E1). The teachers in schools A, B and D were more willing to use virtual classes than teachers in

school E and C (see Table 6-4). However, teachers in C and E were not against using virtual classes, but conditions restricted their use.

Table 6-4: Which functions were not used in Classera

The number of the teachers' functionality they did not use in Classera		
Virtual classes	Discussion board	homework
4 (E2, C1, C2, C3)	1 (C1)	3 (C1, B2, E1)

The **Discussion board** was also not used by the teacher in school C and this was mainly due to limitations of time. The **homework** function was also not used by three teachers, who all agreed that they did not like to use Classera's homework not because of the nature of the assignments themselves but because of the huge tasks on learners' shoulders. As one teacher said: "*learners are required from the Ministry to do homework in their books and the school encourages us to use homework icon where both became compulsory." (A1).* This will be discussed in more detail later.

All of the teachers across the five schools agreed that Classera helped them in different aspects. Their responses were grouped into: **enhancing and extending teaching; saving time; enhancing communication between teacher and learners;** and **being more efficient** (see Table 6-5).

Table 6-5: Teachers views of what is valuable about using Classera

Teachers thoughts of what is valuable about using Classera			
Enhancing and extending their teaching	Saving time	Enhancing communication between teacher and learners	Being more efficient
14	10	7	6

As with ICT in general, all of the teachers believed that Classera helped **enhance and extend their teaching.** This was because they could now share resources including using YouTube clips and pictures. This gives an indication that teachers would use the uploading

materials function in preference to other functions in Classera. One teacher explained: *"uploading materials meant that teaching could take place after the lesson we were restricted with the lesson time and had no chance to show learners things relating to their lesson but with Classera I can share with them pictures, videos or stories after giving the lesson at the school."* (C2). Another teacher added: *"Classera helped me to send examples of the previous tests and it provides direct feedback for each student which also helps the learners themselves to know in which stage they are."* (C3).

More than half of the teachers agreed that Classera **saved time** and they gave different examples. Some teachers found Classera saved their lesson time and one teacher explained: "*I send a video that is related to the next lesson to my learners and ask them to watch it before coming to the school so they have a general view of what we are going to discuss. So, this meant I spent two minutes introducing the topic and had more time for explanation.*" (C2). Another teacher had a similar view and added that *"when there are school events most of the lessons are cancelled and we have no chance to catch up lesson time. Now with Classera we replace the lessons with a virtual classes and cover what has been missed"*. (B2). Some other teachers found uploading material through Classera such as hand-outs and PowerPoint saved time as one teacher said: "*copying the worksheets every day for each class was wasting my time."* (C2). Some other teachers found automatic correction and feedback was saving marking time and one teacher said: "*we were wasting our time in correcting the assignments and the exams for each learner but now Classera corrects and provides us the final marks automatically."* (E1).

Around half of the teachers found Classera helpful **in enhancing the communication between teachers and learners.** For example, emailing learners with any news about the school events and exams dates and as one teacher said: "*the day before the final exam, some learners may have concerns about a particular lesson or question and Classera helped me to stay online on that day to help any student with difficulty."* (D3)

Some teachers agreed that Classera helped them **to be more efficient.** For example, they could save their files in one place, making it easy for them to access whatever they needed. Classera saved wasting paper and one teacher said: *"I find all my work easier than before as Classera helps me to save all my files in one place."* (C1). Some teachers found Classera helped the administrators track learning and provided records of learners' progress. One teacher explained: *"the school can look at my records any time and knows what I have done and check the performance of my learners as well."* (D3) Another teacher had a similar view, saying: "*we have recorded evidence for parents and the school now*." (A3).

None of the teachers put forward ideas as to what was not useful in Classera, though as will be seen later they were aware of constraints on their use. However, their positive responses suggest the teachers found Classera a helpful tool and as one teacher said: *"Although I have an overload of work, I try to use Classera as much as I can as it serve me a lot."* (D1).

6.2.3 Students' use of Classera: what they liked

Teachers were asked to talk about their learners' use of Classera. More than half of the teachers agreed their pupils were more interested in viewing the **Videos** and pictures that teachers had sent through Classera than other functions. In fact, students' views of these other functions were varied. One teacher said their learners liked to use **Email** and another two teachers mentioned their learners liked to receive **Automatic feedback** because it measured their progress (see Table 6-6).

Table 6-6: the number of the teachers who said their learners used Classera functions

What learners used in Classera according to the teachers				
Video lectures	Email	Automatic feedback	Homework	Virtual classes
9	1 (E1)	2 (C2) and (B2)	3 (C3, B2, D3)	1 (B2)

However, there was general agreement across the five schools that their learners did not like Virtual classes or receiving Homework through Classera. Most of the teachers found their learners did not like to use Virtual classes because they had taken everything in the school and wanted free time. As one teacher said: *"the learners do like to use virtual classes because they feel they have finished their lessons and want to enjoy their life for the rest of the day."(*A2). Only one teacher said their learners liked Virtual classes.

With respect to homework, as teachers highlighted earlier, learners found it inefficient to work on textbook tasks and Classera assignments at the same time (see page 151 for more information). In brief, learners were happy to access video and pictures icons but did not want more instructional materials.

6.2.4 **Teachers' beliefs about parents' use of Classera**

There was general agreement among teachers that most of the parents encouraged their children to use Classera. For examples, they provided internet access, computers at home and they allowed the learners to access Classera. One teacher explained: *"Now all the children have their own devices and internet access so parents are already used to seeing their children engaged with such tools. The school also educated parents about the benefits and rewards their child may have through using the portal."* (D3*).* Only two teachers highlighted that the parents took the computers from their children at specific times. As one teacher explained: *"Only through the exam times, I found some learners were not allowed to use Classera at home in order to save their time but through discussing with them about the importance of using Classera on these days, we were able to persuade them."* (B3). Parents in general were believed to be positive about ICT use and they were not seen as an obstacle on their children's use of Classera.

6.2.5 **Teachers' beliefs about teaching and learning**

The teachers were asked to provide some information about the methods they believed worked best with their learners. There was a general agreement among teachers that student-centred learning is an effective method. However, all of the teachers across five schools highlighted the importance of supervising learners while using it. In another words, teachers believed they had a role in working with student-centred approaches. As they all agreed that learners could not be left alone without providing any support and one teacher said: "*the students were given a film talking about the ratio and the fixed rate to understand the differences between units then I gave them a question during the lesson that Mohammed walked 50 meters in five hours so how long does he take in each hour? Then I gave them 10 minutes to think about it but I cannot leave them alone as I need to supervise them and watch what they are doing and answer any concerns that may raise.*" (B3). This gives an indication that teachers were aware of their role in supporting learning.

In general, the large majority of the teachers highlighted methods that reflected modern teaching approaches in which the teachers were more aware of the facilitator role. The teachers gave examples of **teaching through play; ICT use; group work** and **teacher-centred method** (see Table 6-7).

Table 6-7: the number of teachers in each teaching method

Teaching through play	ICT use	Teacher-centred method	Group work
2	3	3	4

Four teachers believed more in the importance of **group work** where learners were put into groups, provided with tasks and where the teacher acted as a facilitator as needed. One teacher said: "*we have not separate learners' tables except for exams days*" (A2).

Two teachers talked about the importance of **teaching through play**, they believed more in giving the learners puzzles or experiments and asking them to discover what they had noticed while playing. One teacher explained: "*letting the learners find knowledge by themselves through play helps them remember what they have learned for a long time*." (D2)

Three teachers mentioned they used **ICT** and believed ICT encouraged learners and increased their concentrations. As one teacher said: "*I was teaching for 45 minutes and learners were silent listening to my explanation but this generation get bored very quickly, so we have to use ICT such as watching video to get learners' attention."* (B3). This signalled an interest in modern teaching methods but, in terms of strategy, the role of the teacher might still be as an instructional one.

Only three teachers still believed in the importance of **teacher-centred** approaches where teachers would use more explanation and do most of the teaching by themselves. In school A, the English teacher explained: "*I believe that the classical method is still working where the teacher starts by connecting the topic with the real life then explaining and checking if the learners understand the lesson. But the teacher needs to add something, such as picture or video to encourage learners and to confirm the knowledge obtained from the lesson*" (A2). In school D, the teacher also believed that*: "the traditional teaching is the best way as I am teaching science subjects and I found the theoretical parts need more explanation through the board. To be honest, I am using ICT only once a week because I also believe in its impact on my learners." (D3*).

Of course, many teachers wanted to use a variety of methods and they believed that their choice of method was based on the nature of the lessons and the learning styles of the students. As one teacher said*: "I cannot say there is specific method that I use every day and that is because the lesson's topics are different and the learners have different learning styles. So I need to use a variety of methods to cover all of their needs.*" (A1)

The teachers were asked whether the use of Classera changed their teaching practices. This main subheading was coded into agree or disagree. The majority of the teachers agreed Classera did not change their teaching practices. However, the teachers found Classera a help and one teacher said: *"my teaching has not changed but it saves a lot of my time during the lesson and allows me to communicate with my learners." (*C1). Only one teacher found Classera changed her teaching; as she explained: *"Classera changes the way of my teaching where I find my learners took some part of the teaching process."* (D1). In contrast, only one teacher had a negative attitude toward Classera, pointing out that: "I *have never benefit from using Classera at all." (B 2).*

In summary, teachers were often flexible when it came to teaching and they did not directly reflect the idea of 'traditional teaching in the traditional society'.

6.2.6 ICT infrastructure

This main theme was categorized into three sections: what is available in the schools, what is not available and the constraints teachers experienced in terms of ICT tools. All these sections will be discussed in each school separately to demonstrate the differences between each case and give the full picture of each school.

School A

All of the three teachers agreed that their school provided a projector in each classroom and internet access in the whole school. However, they experienced a low internet speed and one teacher explained: *"the school administration puts a teacher in charge for each department and provides her with four laptops which teachers in that department can ask for. The school is dealing with ICT and everything I need I can find it. However, the internet speed is a bit slow and it may take 50 seconds to open a page."* (A2).

School B

All of the three teachers agreed their school had three smart boards, a projector in each classroom and internet access for the whole school. However, they also raised the problem of low speed of the internet access. One teacher explained: "*the school provides Aurora, AVS and IniGma and we have everything available that is up to date except 3D but I am really struggling with the internet where one day I find it excellent and the next day too difficult .*''(B2).

School C

All the teachers agreed that internet access was not available. As one the teacher said: "*there is no internet access at the school but every teacher brings her own laptop and the router to the school every day."* (C1).

School D

All of the three teachers agreed that the school was up to date with ICT devices and internet access was provided for the teachers to use, but the teachers were facing problems with internet speed in their school. One teacher said: "*the school provides 18 projectors and 18 Smart Boards meaning one in each class and I can use the internet while I am teaching but only sometimes I find the internet speed is low."(*D2)

School E

Two teachers agreed that there were projectors, interactive boards, internet and laptops for teacher to use, but the internet access was too difficult to use. As one teacher explained: *"we have laptops in the school and we can use it at any time but the internet access is too poor. I cannot use it in the class but the school promised us to fix this problem soon."* (E2).

There was a general agreement among teachers across the five schools that schools should provide internet access for the learners to use. Their reasons were that learners had already access to the internet at home and using it at school would help the learning process.

However, they highlighted that the learners should be allowed to use it only at a particular time with the supervision of their teachers. As one teacher said: *"as a teacher and a mother I will say we should let them use the internet. I wants prevented my child to use the internet but I realized after that he would not be able to cope with the new technological era. So our roles is to promote good values in our learners and teach them how to use it in a good way and give them the opportunity to use it because if we are not doing this, they will explore everything by themselves."* (B3). Another teacher who had a similar view said: *"we should provide the internet at schools to teach the learners how to make use of the internet in developing themselves."* (C2). None of the teachers had negative attitudes toward this issue.

In brief, it is noticed that there was a lack of good internet speed in the schools. However, school C was the only school which had no internet access. Schools A, B and D were attempting to provide more ICT tools in their schools (see Table 6-8).

Table 6-8: ICT tools available in each school

ICT tools	School A	School B	School D	School C	School E
Internet access	Had internet access	Had internet access	Had internet access	Not available at the school	Had internet access
The Speed of the internet	Low	Low	Low	---	Low
Laptops for teachers to use	Yes	Not mentioned	Not mentioned	No	Yes
Projectors	In each class	In each class	In each class	In each class	In each class
Interactive board	4	3	In each class	One	3

6.2.7 Training

In this main theme the teachers were asked to provide some information about ICT workshops they had attended. The nature of the workshops available at each school will be discussed separately to distinguish the differences, opportunities and constraints teachers experienced in each school. The teachers in school A were very eager to talk about the

training while teachers in all the other schools had less to say. However, in school B, the teachers did say they received helpful workshops (see Table 6-9).

Table 6-9: the nature of ICT workshops in each school

ICT training	School A	School B	School C	School D	School E
Did the teachers receive workshops about Classera	All said yes	All said yes	All said yes	All said yes	All said yes
Did they find Classera workshops helpful	All said yes	All said yes	All said yes	All said yes	All said Yes
Did they receive other ICT workshops at the school	A lot	A lot	No at all	Only once	Not mentioned
Were the teachers encouraged to shared their ICT knowledge with their colleagues	Yes	Yes	No	No	No

School A

All of the teachers agreed that their school was providing a large number of ICT workshops, including Classera workshops run by Classera representatives. The teachers noted the workshops offered were comprehensive provision, useful and fun to attend. As one teacher explained: "*I had no idea about using Classera but after having workshops and communicating with Classera representatives I have the full confidence to use it and I find it easy to use. The school provides very many workshops that are related to ICT and it really gives us key knowledge and key aspects about ICT which encourages me to search further to be more experienced in ICT use.*" (A3).

The teachers talked about the school as being responsive and what the teachers described is a situation where the training offered was responsive to teachers needs. As one teacher said: "*the school gave a teacher responsibility to fix technical issues even during the lesson and if we feel that we need a training workshops in a particular thing, we ask the school and they immediately offer it to us*" (A1).

They also spoke positively about the help that Classera representatives gave, noting that Classera provided just-in-time feedback, with one teacher explaining: "*we also receive a huge support from Classera representative as we can phone them at any time and if we need her to visit us in the school, she sends us an email through Classera indicating the time and the date she will available at the school*." (A3).

The teachers agreed that most of the workshops they had attended were relevant and could be applied in practice. As one teacher said:*" I can say that the training workshops are boring if the school does not provide us with ICT tools but we take the workshops and apply it immediately because it is available in the school so we do not have any excuse not to use it in our classes."* (A1).

The teachers were proactive, they shared their ICT knowledge and showed how useful that was. One teacher explained: "*I trained myself and became excellent in using ICT and I did a workshop in the school for other teacher about how to use I pad in teaching."* (A1).

Finally, the teachers were also provided with an entry point where all the teachers could benefit from workshops; as one teacher said: "*most of ICT workshops I attended were useful and it helps professional teachers to refresh their mind about ICT use and it helps other teachers who do not have any knowledge about ICT to use it. Most of them are useful. It taught us how to integrate ICT in teaching. I have attended an interesting workshop offered by a school colleague and that was about using different applications in teaching.*" (A2)

In brief, the teachers in this school received help internally to use ICT and externally to use Classera and the teachers were willing to educate themselves about ICT tools and were given the opportunity to exchange knowledge with other school teachers.

School B

All the teachers agreed that they had received helpful workshops about Classera and other ICT tools at the school. As in school A, the teachers talked about the importance of sharing practice. As one teacher explained: "*we received two workshops about Classera and it was helpful and I think we do not need more than that as it is so easy to use. Some teachers are excellent in using ICT and they usually offer us ICT workshops at the school and it is really useful. We have IT department who offered us also free workshops every Sunday"* (B1). The teachers of this school were also offered help externally to use Classera and internally to use ICT tools.

School C

All the teachers agreed that they received two workshops about Classera and that the school had never provided any ICT training sessions. The teachers also agreed that they taught themselves about ICT use. One teacher explained: "*we took two workshops about Classera and it was useful but the school has never offered any ICT workshops. I searched how to design videos FOXK and taught myself about that."* In this school, it seemed that the teachers received help only externally but not internally, as there was a lack of ICT workshops at the school.

School D

All the teachers agreed their school offered only one workshop about smart boards, with hands on experience, and two sessions about Classera. One teacher explained: "*Classera offered two workshops and they were inclusive. The school offered only one training workshop that was about the Smart board, to enable us to activate it and use it. I taught myself how to use documentary Camera and other ICT tools*". Teachers had received more help from external parties than internal ones.

School E

The teachers only mentioned about Classera workshops, but did not give any details of whether the school provided any other ICT workshops. One teacher said: "*Classera representatives come occasionally and teach us about class preparation and how to upload plans and other things and they come when they add something new to explain its use. Otherwise it is fine because the use of Classera is very easy and the more you go, the more you learn."* (E1).

In brief, all the teachers across the five schools agreed they received workshops about Classera and that they were inclusive and helpful. However, the teachers had different views towards other ICT workshops their offered. We can see that schools A and B were more aware of the importance of ICT workshops, as they encouraged specialist ICT teachers to provide sessions. In school D, the school focused on providing teachers with workshops on the use of Smart boards, which was because all the school boards were replaced, but there was a lack of other ICT tools. The teachers in schools E and C had little opportunity in their school to develop their ICT skills. In general, the majority of the teachers were willing to use ICT and to use Classera but the level of support differed. To conclude, schools A and B provided the best support for the teachers to develop their ICT.

In respect to the Ministry of education ICT workshops, the teachers agreed that the level of provision was inadequate and seven said they had never been offered training at all. Four teachers had attended workshops but found them inadequate. One teacher explained: *"The Ministry of education offered only one ICT session and that was three day of one workshop delivered by the supervisor. I think they wasted their money as the workshops were poor and the trainer had no knowledge of how to do workshops at all. I went back home with nothing at all."* (D3). We can understand that the Ministry of education encouraged teachers to use ICT but they ignored

the importance of developing teachers ICT skills, which implies that there is a lack of clear ICT policy.

Teachers helped each other not only through organized CPD but informally. In fact, all the teachers agreed that if they had a problem then they could go to another teacher. As one teacher said: "*the school teachers are collaborators where they share their modem and laptops when we need it"* (C2). It is noticed that there was no difference in the teachers' responses across five schools towards the involvement of their colleagues. None of the teachers mentioned any type of discouragement they received from other school teachers.

6.2.8 **Supervisors**

This main theme was used to find the help and the constraints teachers experienced while dealing with supervisors of the Ministry of Education. Thus, it was coded into the encouragement and the constraints.

With respect to encouragement, all of the teachers following the Ministry of Education curriculum. Teaches in school A and some in schools B, C, and D said that supervisors evaluated their use of ICT as it was included in the checklist when supervising teaching. However, all of the teachers said that the supervisors had no special interest in teachers' use of Classera and their interest was focused on ICT in general. This did not exclude Classera, but it did not promote Classera either. One teacher explained: *"my supervisor asked me to use* ICT while *teaching. I have not faced any difficulties with my supervisor about Classera but they are focusing on particular things such as lesson plans and I give her the attendance and plans on paper*." (A1). Another teacher had a similar view, saying: "*the supervisor encourages me to use Classera but she has never discussed its functions with me. She required me to use any ICT tool during the lesson as it is one of the requirements she checked*." (D2).

In general, there was some dissatisfaction with the role of the supervisors and the idea that they did not fully understand teaching in the contexts in which people worked. The teachers felt pressure to use particular strategies. In another words, supervisors had specific points that they were looking for in their checklists. As one teacher explained: "*The supervisors come one to two times a term and they evaluate us only from those visits and this is unfair. The one who should evaluate me is the school and the learners who are in the school. The supervisors evaluate us on things that are less important than content such as displaying ICT while teaching. I believe that ICT use is important in my teaching but I know when to use it. The matter is not to use ICT every day but how to integrate it at the right time with the right lessons where some lessons need other strategy than ICT.*" (A3).

6.2.9 **Curriculum**

All the teachers following the Ministry of Education curriculum found restrictions which regard to the syllabus. In particular, the teachers felt pressurized to complete the assigned curriculum following an unrealistic timetable which put pressure on them and their learners. This affected the quality of their teaching and dampened their enthusiasm for new initiatives such as Classera. As one teacher said: "*I taught in talent school where teacher had the freedom to choose methods and materials. I was acting more as a facilitator where I gave the learners the chance to do experiments and encouraged them to find the result by themselves. But everything is different with normal schools. I have to finish 8 chapters including different areas such as nuclear, light etc within three months and I have to prepare learners for the achievement test to be able to register in the university. All of these constraine me*." (A3). This quote shows the restricted nature of teaching, although the implication for Classera itself are not spelt out. However, all teachers who taught international curriculums in school B and E agreed that they had more flexibility in their curriculum (See section 4-5).

6.2.10 **School heads**

This subheading was coded as whether school heads had encouraged or discouraged teachers to use Classera and to find out the extent of the headteachers' involvement with their teachers. All of the teachers across the five schools agreed that their school heads encouraged them to use Classera. None of them said their heads discouraged them. This might be because the school heads had been responsible for bringing Classera into their schools

However, the ways encouragement was expressed and the involvement of each school head was different. In school A, for example, all the teachers agreed that their school head was supportive, friendly and eager to help teachers develop their skills. One teacher said: "*I am lucky that I am working in this school. The school likes development. If someone tells you that there is an obstacle in our school, this will be from themselves not from the school."* (A1). Another teacher from school A who had a similar view said: "*Our school is typical as it encourages teachers not only to use ICT but in all other aspects. They reward teachers and learners with no absences. The school head is looking at what we are uploading through Classera every day and has the right to look at each profile. She gives us her feedback on what she found and we really feel that she encourages us to work harder to improve ourselves and achieve the best. We feel our school leader is one of our best friends."* (A2). Another teacher from school A also agreed that: "*our school head rewards us on the daily use of Classera and encourages learners by rewarding the high users by calling their names and giving them a certificate at the early morning assembly the school members and providing them free breakfast on that day and this makes learners use Classera only to gain rewards*." (A3).

School A was outstanding in the way that it supported teachers in general and supported the development of Classera. School B offered less support than A but more than the others. School B is an example of a responsive head and one teacher highlighted: "*Our*

school leader is reasonable and if we ask her to provide something she provides it." (B2). However, none of the three teachers in school B talked about the proactive encouragement the teachers in school A talked about. In school C and E, the headteachers had an instrumental approach to the development of Classera, where they asked teachers to use Classera but they provided only very weak encouragement for their use. One example from school E, the teacher said: "*They are always tell use to use technologies and Claasera*" (E1). Another example from school C, one teacher explained: "*we do not have much communication with our school head so we only see her at the meeting times. When she observes our teaching she did not discuss anything with us but she encourages us to use Classera as she rewards the high users.*" (C3). In school D, the headteacher was supportive and encouraged teachers to use Classera. As one teacher highlighted: "*Our school head encourages us to use Classera and ICT. They always thanks us for our efforts in the school and their offered purposeful rewards for the high users such as going home earlier or not to let us enter classes for the absent teachers*"

In brief, the headteacher of school A was outstanding in offering support, followed by the head school of D and then B and finally C and E.

6.2.11 **Opportunities and Constraints**

In this final section, I cover the responses of the teachers about the opportunities and constraints that they had seen. The responses have been divided up into these two areas (see Table 6-10 and Table 6-11).

Table 6-10: The teachers' responses in respect to what encouraged them to use Classera

Opportunities and encouragements
Classera's functions (n=14)
The simplicity of Classera use (n= 14)
Rewards (n=4)
School head (n=3)
Students (n=2)

Table 6-11: The teachers' responses in respect to the difficulties

Difficulties teachers experienced while using Classera
Students (n=14)
Ministry of education requirements (n= 6)
Lack of clear policy between the Ministry of Education and schools (n=6)
Lack of time (n= 4)
The restriction of the school to use Classera (n=3)
Rewards (n=2)
Access Classera only form the computer (n=2)
Problem with the Arabic fonts(n=1)

In respect to the **opportunities**, the teachers' responses have been divided into: **Classera's functions; simplicity of its use; rewards; the school head and the students**

All of the teachers found **Classera's functions** encouraged them to use it. For example, it made the communication between learners and teachers easier, changed the ways of assessments and the large majority agreed they used it because it saved them time in lessons (see section 6.2.2).

All the teachers across the five schools agreed **the simplicity of Classera use** encouraged them. For example, it did not take much time to upload material as one teacher said: "*Classera takes only 30 seconds to upload things.*" (A2).

Four teachers found Classera's **rewards** enhanced their use, this was when teachers gained points if they used any functions such as uploading material or virtual classes. As one the teacher explained: "I *have never used the rewards that Classera offered but I found it is encourages me to use it and it gives me a feeling of the achievement."(D3).* Another teacher added: "*I try to use Classera every day to gain the highest point."* (C2). All of the teachers in school A agreed that their **school head** was encouraged them to use it (See section 6.2.10).

A few teachers found their **students** helped them to use Classera if they asked to upload things through Classera; one teacher said *"I am teaching 45 learners and only 20 of them use it. Those learners are really encouraging me to use it as they ask me to upload every day."*

In respect to the **constraints** that might prevent teachers from using Classera, all the teachers agreed that they had not experienced any outright obstacles. However, most of the teachers found some difficulties. These difficulties are divided into: **students; the Ministry of Education requirements; lack of clear policy between the Ministry of Education and schools**; **rewards; lack of time; restriction from the school in the use of Classera; problems with the Arabic fonts; access Classera only from the computer and the process of creating texts; limitation of Classeras' question bank and analytics** (see Table 6-11).

The most frequently cited obstacle was **the students**. All the teachers found difficulties with the refusal of some students to use Classera. The teachers mentioned some reasons that might make students unwilling to use Classera. Examples were: students used Classera to do tasks not for fun, students were lazy, students believed that they were leaving the

school and the rewards were not going to give them anything meaningful, students were overloaded and Classera makes things that were not compulsory for the students become a requirement. One teacher explained: "*l faced difficulties with some of my learners as I have noticed that learners are lazy where they give their own password to other students so it appears that they accessed Classera."* (B2). Another teacher added: "*Secondary learners dislike using it and they use any excuse such as their password is not working. I upload all the important worksheets through Claasera and I do not hand it out in the classroom to force them to use it. However, what I have noticed is that only three students access Classera to download work sheets and print it for the rest of the students instead of making all the learners access it and I think that is because they believed that they are leaving the school and rewards are not going to add anything to them."* (D3). Another teacher highlighted: *"A few learners are not using Classera. When they were absent they came to school next day without asking them about any tasks but now with Classera the learners are required to access Claasera and view the lesson that she missed and do the homework so I think some learners do not like this way they want to be relief." (*A2). Another teacher mentioned a different reason for her learners rejection and she said *"Learners are not using Classera not because their parents or lack of devices but they do not believed in it".*

Six teachers found difficulties with **the Ministry of Education requirements**, as these teachers raised similar concerns regarding the supervisors and curriculum (see sections 6.2.8 and 6.2.9).

Another six teachers agreed that they were required to provide learners with two homeworks and this gave an indication that there was **a lack of clear policy between the Ministry of Education and schools**, with teachers and learners suffering in between. As one teacher explained: *"I accept learners' homework either on paper or through Classera because the main thing to me is the production. I cannot reduce learners' marks if they do it in their books. It is not*

officially required from the Ministry of Education and learners themselves know that we cannot do anything if they refuse to do it through Classera." (D3) (see sections 6.2.2 and 6.2.3).

Two teachers found difficulty with **the rewards** that Classera offered. One found teachers and learners tend to access Classera only to gain rewards but not to view content itself and she explained: "*The teachers are uploading anything to Classera to gain the rewards and the learners' access Classera and gain points without looking to the content itself."* (C1). Another teacher had a similar view and she said: *"my daughter is using Classera just to have rewards but she is not interested to watch what has been sent." (A3).*

Four teachers found the difficulties with finding the **time** to use Classera; as one teacher explained: "*the deficiency is from my side as I don't have enough time to use all of Classera icons but I promised myself to use it in the next term to make use of it and use the dissuasion board more with my learners.''* (B1) (see section 6.2.2).

Three teachers found **restriction in the school** about the use Classera. They had to use Classera. They believed that they might make more effective use of it if they used it when they needed it. As one teacher explained: *"The teachers are accountable by the school to use it every day and if we use it when we need it I mean few times there will be penalty. I got a certificate today as I am one of the highest user in our school and I really like to use it only when we need it."*

However, some teachers highlighted technical shortcomings in the platform itself. Two teachers said that they could **access Classera only from the computer** and proposed they should be able to access it through their mobile devices and receive notifications. They hope to use Classera through their mobile and show notifications, so teachers know immediately anything that learners post as one teacher said: "*I hope to use Classera through my mobile device and to add a notification for Classera as other applications we are using to help us get easier and faster to our learners"* (D2). Another teacher had a **problem with the Arabic fonts** and

these were not recognized by automatic testing software and she said: *"I am really struggling with the numbers in Classera as assessment is in English and I am teaching math in Arabic so when learners answered short exam or assignment questions they used Arabic numbers where the automatic correction find different answer which are the same but in different language then it shows me the learner got zero in this part. I suppose if they could provide the numbers of two languages so the teachers and the learners have the choice."* (B2). One teacher highlighted that **the process of creating texts** was time consuming. She wanted a quick way, even if technically that was not possible at present. She said: *"I waste three to four hours per day just writing the questions tasks and I think this is much harder for math teachers than others because we need to use symbols and write in a particular way. But the main problem for me is that we cannot either copy or paste nor upload written tasks from the Microsoft Word. Thus, I suggest if they could make exams and assignments more flexible by adding the function of uploading written materials to exams and assignments"* (B3). A maths teacher liked to use the questions that Classera offered but suggested it should provide a larger **question bank**, saying: *"there are questions that already have been made by Classera but if we could have more questions in the bank that will be beneficial for both of the teachers and the learners."* (E1). Another teacher found it difficult to use **analytics,** where it showed her only the names of the learners who did the task but not for others. As she explained: "*Classera shows only the names of the learners who did the tasks where I usually display analytics for a particular homework in the classroom and ask learners to stand if they heard their name. This help me to identify exactly the names for the learners who did not do the task*." (D3).

6.3 Summary of the findings of the teachers

Teachers use of ICT

All of the teachers agreed that they used ICT every day for personal use.

All of the teachers used ICT in their teaching and displaying content was the most frequently cited use.

The teachers' use of ICT was one of the requirements of the Ministry of Education.

Teachers in schools A, B and D received more opportunities via ICT workshops and access to such tools in their school than in schools C and E.

There were different levels of flexibility in school policy about learners' use of ICT and the school heads of A and D were more open relatively.

Teachers' beliefs towards using ICT in their teaching

All the teachers felt positively about the use of ICT and believed that ICT was important in their teaching.

All the teachers agreed that ICT could not be used every day with every lesson.

The practice use of ICT among teachers was varied and affected by conditions in different schools.

Teachers' use of Classera

The majority of the teachers were relaxed about using communication tools with their learners through Classera and did not see this is as undermining their status.

Course material, Video Lectures, Homework and Exams functions were more popular functions than others.

Around half of the teachers used communication via Classera.

Classera's library, analytics and attendance logs, and virtual classes were less used.

The teachers in schools A, B and D were more willing to use virtual classes than teachers in school E and C.

All of the teachers across the five schools agreed that Classera helped them in different aspects.

Teachers' views towards what learners like to use in Classera

More than half of the teachers agreed their pupils were more interested in viewing the Videos and pictures that teachers had sent through Classera than other functions.
Learners' views of the other functions were varied.
There was general agreement across the schools that the learners did not like virtual classes or receiving homework through Classera.

Teachers' beliefs about parents' use of Classera

There was general agreement among teachers that most of the parents encouraged their children to use Classera.
Parents in general were believed to be positive about ICT use and they were not seen as an obstacle to their children's use of Classera.

Teachers' beliefs about teaching and learning

The great majority of the teachers highlighted methods that reflected modern teaching approaches in which the teachers were more aware of the facilitator role.
The majority of the teachers agreed Classera did not change their teaching practices but they found Classera as a helpful.
Teachers were often flexible when it came to teaching and they did not match the idea of the traditional teacher in their traditional society.

Teachers' views about ICT infrastructure

There was a lack of good internet speed in the schools.

School C was the only school which had no internet access and had a lack of basic. ICT tools while Schools A, B and D attempted to provide more ICT tools in their schools.

Teachers' views about training

All the teachers across the five schools agreed they received workshops about Classera and these were inclusive and helpful.

School A and B were offered help externally to use Classera and internally to use ICT tools.

The teachers in school D had received more help from external parties than internal ones.

The teachers in schools E and C received help only externally but had no opportunity in their school to develop their ICT skills.

The teachers agreed the workshops run by Ministry of Education were inadequate and seven said they had never been offered training at all.

All of the teachers agreed that they received help informally from their colleagues to use ICT.

Teachers' views about supervisors

All of the teachers said that the supervisors had no special interest in teachers' use of Classera and their interest was focused on ICT in general.

All of the teachers following the Ministry of Education curriculum said that supervisors evaluated their use of ICT when supervising teaching.

Teachers' views about the curriculum

All the teachers following the Ministry of education curriculum found restrictions in regards to the syllabus

All the teachers who taught international curriculum in school B and E agreed that they had more flexibility in their curriculum.

Teachers' views about school heads

All of the teachers across the five schools agreed that their school heads encouraged them to use Classera.

The ways the encouragement was expressed and the involvement of each school heads was different.

All the teachers of school A and D agreed that their principals were supportive and encouraged teachers to use Classera

School B offered less support than A but more than the others and school B is an example of responsive head

None of the teachers in school B talked about the proactive encouragement the teachers in school A talked about.

The headteachers of School C and E had instrumental approach to the development of Classera.

The head of school A was outstanding in promoting Classera, followed by the head school of D and then B and finally C and E.

Teachers' views about opportunities

All of the teachers found Classera's functions encouraged them to use it.

All the teachers across the five schools agreed the simplicity of Classera use encouraged then to use it.

Four teachers found Classera's rewards enhanced their use.

A few teachers found their learners helped or encouraged them to use Classera.

Teachers' views about constraints

All the teachers agreed that they had not experienced any obstacles that prevented them from using Classera.

Most of the teachers found some difficulties while using Classera and these difficulties are divided into: learners, the Ministry of Education requirements, lack of clear policy between the Ministry of Education and schools, rewards, lack of time, the restriction of the school to use Classera, problem with the Arabic fonts and the process of creating texts, limitation of Classera's question bank and analytics.

The most cited subthemes was the learners, as all the teachers found difficulties with the refusal of some learners to use Classera.

6.4 The interview schedule for headteachers

6.4.1 Headteachers' general use of ICT

All of the headteachers agreed that they used ICT every day for personal use, for example booking, communicating, shopping and banking transactions. They gave examples for booking flights, logging appointments and reserving hotels. They also used social media such as Facebook, WhatsApp and Twitter to find out more about news and for communicating with friends and family. Only one head teacher mentioned she used WhatsApp as a social media tool to communicate also with her teachers. She said: "*I created a group where all the school teachers are so we could communicate with each other whenever we like.*" (A1).

None of the headteachers had never used ICT. This extensive use of ICT on a daily basis gives an indication that these headteachers were knowledgeable users of ICT and may be disposed to develop ICT in their schools

6.4.2 **Headteachers' views towards the integration of Classera portal in their schools**

In this main theme, the headteachers were asked about the reasons that led them to bring Classera into their schools and to what extent would they continue to use Classera.

In respect to the first, the main reason for all five headteachers was to compete with other private schools by providing an environment that attracted parents. One head teacher said: "*any private school wants to bring new things such as Classera into school.*" Another head teacher had a similar view who saying: *"I found Classera was used by many other schools, so I wanted to use it in my school."* (E). This shows that the headteachers were trying to keep up with other schools.

The headteachers of school A, B, C and E had other reasons for using Classera. In particular they wanted a communication tool that would link parents, teachers and learners. As one head teacher said: *"we are using ICT everywhere. It is so slow in the schools, I need to find another way of communicating."* (A).

The principal of school D had a different emphasis. She was more interested in ICT use and believed it might have a direct impact on learning outcomes. She visited several high-ranking schools in the Middle East and found they used many ICT tools including e-learning systems. They believed these systems had positively affected their outcomes. This head teacher felt that her role was to bring such tools in to her school and she was the first who bought Classera for her school. She explained: *"my main role is to bring these tools to improve learning and learner achievements. And I was the first school in the region who used Classera. But I would like to say that the use of such tools will never replace the teacher's role. But we should use it because of its impact on the learning process."* (D)

In respect to what made the headteachers select Classera in particular, all of them agreed that they decided on Classera because of its reputation, the services and the functions

offered. As one of the head teacher said: *"Classera is a global company where they have a high standard of processing problems on the same day and the portal is provided with a lot of useful functions."* (D). Another head teacher had a similar view: *"when we have started using Classera, we noticed that Classera does not show us of the nationality in each classroom. Then we send to Classera representatives an email illustrating the main point the school would like to add to the portal and they have fixed the problem within few days. We are now able to identify nationality in each class."* (E).

In respect to the extent to which the schools would continue using Classera, the headteachers of schools A, B and E all said they would renew the contract with Classera for further years. They found it a useful tool that helped the teaching and learning process. One head teacher said: *"I think I am going to carry on using it. It helps the teachers to save lesson time, the parents to communicate without the need to come to the school and expand learners' knowledge where they receive useful information that might not be in their textbooks."* (B). On the other hand, the headteachers of schools D and C said they would not renew the contract. The head teacher of school D would use the e-learning system that the Ministry of education offered (iEN) and would not renew Classera contract for the next year. As she said: *"I cannot use two e-learning systems at the same time."* (D) (see section 1.3 for more information about the iEN programme). Meanwhile the head teacher of school C had found another free e-learning system that did the same job. This shows they were not against the use of VLE but they had cost effective alternatives.

6.4.3 **Headteachers' views towards teachers' use of Classera**

In this main theme, the headteachers were asked to talk about their teachers' use of Classera portal and what they would doing to encourage their teachers to use it. I will look at the five schools individually below.

School A

The head teacher felt that most of her school teachers were using Classera frequently. She was energetic and she checked the teachers' use frequently by looking at the Classera dashboard. She felt that she was supportive to her teachers. For example, she asked the teachers to use Classera at work but not at home to protect their free time. She tried to reward the high users of Classera, both teachers and learners. However, she set clear consequences for the teachers who did not use it; as she explained: *"But only very few teachers are not interested to use ICT or they have a long teaching career and find it hard to change their practices. So I firstly give a reminder and if she is still not using Classera I may cut some of her salary, because I do everything to encourage them."* (A). Her general view was that every teacher should use ICT and be able to cope with new generations of it. She found most of her teachers were using Classera most of the times.

School B

The head teacher was less directing than those of schools A, C and E. She was prepared to integrate Classera gradually as she believed that her teachers would use Classera more frequently as they got used to it. She encouraged the teachers to use Classera gradually, for example she recommended them to start using videos and setting homework and maybe after that they might want to move to use Classera calendar in the next step. She explained her thinking: *"I have brought many other ICT tools in school and at first the teachers were not using it but I found after a period of time the teachers get used to it and the same thing will happen with Classera. Not all the teachers are using it frequently as we have started using it."* (B).

School C

The head teacher was directive, asking her teachers to use Classera. However, she did not set any consequences for non-user teachers. She said that most of her teachers were

enjoyed using Classera and they used it frequently without the need for any intimidation. As she said: *"most of the teachers are using Classera and they want to do so."* (C).

School D

The head teacher was aware of the importance of teachers' ICT skills in teachers daily life as she said the teachers who did not have ICT skills would not be able to accomplish such things as paying bills, or booking an appointment in government sectors. She was also understanding of the differences of ICT skills between new teachers and teachers who had worked with Classera for a long time in her school and believed that teachers' rejection of the use of ICT could not be ignored. However, she was aware of the importance of encouraging teachers to use ICT tools and understanding the reasons for teachers' rejection. As she said: *"I believe that the encouragement promote teachers to use Classera as I have rewarded many teachers of their frequent use. But, I cannot ask the teacher who just joined the school to use it as the teachers who are using Classera for so long time."* (D).

School E

The head teacher in this school was more directing, in that she made Classera use compulsory for her teachers and made it one of their duties to show they had used it. She asked the head of the IT department to access logs of teachers' weekly use, and then report to her. She set consequences for teachers who did not use Classera. As she explained: *"I believe that if I do not require the teachers to use it, they will ignore it……..Therefore, any teacher who is not using Classera for any other reasons than technical problem will receive a reminder letter and if she is still resistant to use it we gave them two other letters. But if all of these attempts fail, I terminate their contracts and they would no longer work in the school."* (E). In fact, there had not been example where this happened, but it was clear to me that she was expressing this conviction sincerely and this would actually happen if necessary.

6.4.4 Headteachers' views towards providing internet access for learners to use in their schools

There was a general agreement between the heads of schools A, B, D and E that learners had internet access in ICT lessons. As we saw earlier, the headteachers of schools A, B and D were relatively more open about the use of ICT. They allowed learners to bring their own ICT devices and learners had access to the internet in other subjects under the supervision of their teachers (see section 6.2.1). As one of the head teacher said: *"I made a day called studying without bags where learners came to the school without bringing their bags and they used iPads instead. But because we are living in a conservative society, I faced difficulties from few of the parents as they went to the Ministry of Education and complained about the school and wanted to shut the school down."* (D). Although, the head teacher of School C was interested in providing internet access for the learners in ICT lessons and for teachers, the school faced a lack of optical fiber in the locality that placed an obstacle in providing students with access to the internet. As she said: *"I really would like to let the teachers have internet access at the school but my main problem is that the school had built in street that does not has optical fiber yet. They told us they are going to fix it at the end of this year and once it reaches, I will connect it to the whole school. But at the meantime, the teachers could upload videos from their laptops at home and show it for the learners in the classroom through the projector."* (C). In brief, none of the headteachers were against providing teachers with internet access at the school or having learners it in ICT lessons. However, only schools A and D were keen for learners to access it in all lessons.

6.4.5 Headteachers' views towards the Ministry of Education in regard to ICT use

In respect to the Ministry of Education, all of the headteachers agreed that the Ministry of Education required schools to be equipped with basic ICT tools including projectors and a computer lab. As one head teacher said: *"the Ministry of Education does not restrict us to use particular ICT tools but they require every school to be equipped with projectors and computers for the computer lab."* (E).

In respect to software, all the headteachers were aware of, and had used, a software called Nour before Classera. This software allowed the schools to upload all of their administration works such as school plans, learners' assessment and school timetable and all schools including private, international and state schools had to do this (see section 5.3). Briefly, in describing the software the head teacher of school D described something similar to Classera called 'Virtual Eye'. For example, it allowed the teachers to communicate with the learners at home, upload material and arrange virtual classes. She highlighted that the Ministry of Education had recently become interested in e-learning systems and had selected seven schools that were well equipped with ICT, including School D, to participate in an initial pilot study of a portal. She said: *"My school has been chosen from the Ministry of Education to pilot the programme and we have been using it for two weeks."* (D). The headteacher of school D had previously piloted the software "Tatweer" for the Ministry of Education when working on it in another school. This gave her awareness of the difficulties of introducing technology. In fact, Tatweer had been disappointing, as she explained: "*Tatweer was an excellent programme that had useful functions but failed mainly because the Ministry of Education had never set a clear policy on its use and the schools had been chosen randomly without taking in to consideration the features of the schools. I mean if the schools were equipped with ICT*

tools or not. What happened was that they trained teachers who were working at the participating schools for four months, provided schools with interactive boards, laptop for each learner. They also provided the schools with ICT tools that I had never seen in my life. But the problem was that after these teachers had been well trained, they began to withdraw gradually from participating schools and transferred to non-participating schools. I remember 14 teachers left the school. These teachers were pressured they were required not only to teach too many subjects as a normal and followed the Ministry of education requirements but they were also asked to do projects and use ICT which they had never used before. This was without increasing their salaries or at least reducing the number of subjects they were teaching. The teachers found their colleagues in the non-participating schools took the same salary and teaching the same subjects without any other work and this was why these teachers transferred to the non-participated schools." (D).

In respect to Classera, there was a general agreement between their heads that the Ministry of education had no special interest in its use, they neither promoted nor discouraged its use (see section 6.2.8). As one head teacher said: *"the Ministry of Education does not encourage the schools or the teachers to use Classera but they do not prevent us from using it."* (C).

In respect to ICT workshops that the Ministry of education offered, there was a general agreement amongst the heads that the Ministry of Education had not provided enough ICT CPD for the teachers (see section 6.2.7). As one head teacher said: *"the teachers usually receive ICT workshops from their school not from the Ministry of Education."* (A).

6.4.6 **Headteachers' views towards parents in regard to Classera use**

All of the headteachers provided parents with workshops about Classera, illustrating the general idea behind it, the benefits of using the portal and the way of using it. This corresponds to what the teachers had said earlier (see section 5.5). As one head teacher

said: *"we did many workshops for the parents about Classera to let them persuade their children to use it."* (A).

The headteachers felt that parents were happy to encourage their children to use Classera. All of the heads agreed that the learners were using Claasera at home (see section5.5). One head teacher said: *"we have not experienced any student who is not using Classera at home because of their parents' rejection of Classera."* (E). All of the headteachers were aware of the importance of parents attitudes and beliefs when they educated them to make the learners use it at home.

6.5 Summary of the findings of the headteachers

Headteachers' ICT use

All of the headteachers were Saudi and agreed that they used ICT every day for personal use.

Headteachers' views towards the integration of Classera portal in their schools

All headteachers used Classera in their schools mainly to compete with other private schools by providing an environment that attracted parents.

All of the headteachers agreed that they decided on Classera because of its reputation, the services and the functions offered.

All of the headteachers of school A, B and E found Classera a useful tool that helped the teaching and learning process and would renew the contract for more years.

The headteachers of school D and C had cost effective alternatives and would not renew the contract with Classera.

Headteachers as leaders

The head teacher of school A was energetic and supportive but she set clear consequences for the teachers who did not use it.

The head teacher of school B was less directing than in school A but also more than school C and E.

The head teacher of school C was directing but did not set any consequences for non-user teachers.

The head teacher of school D was supportive and understanding of the differences of ICT skills between the teachers.

The head teacher of school E was more directing, made Classera use compulsory for her teachers and set consequences for teachers who did not use it.

Headteachers' views towards teachers' use of Classera

The headteachers of schools A, C and D felt that most of their school teachers were using Classera frequently.

The head teacher of school B believed that her teachers would use Classera more frequently as they got used to it.

The head teacher of school E did not say anything about whether their teachers they used it frequently or not but showed that they should use it as one of their duties.

Headteachers' views towards ICT tools

The headteachers of schools A and D were relatively more open about the use of ICT. None of the headteachers were against providing teachers with internet access at the school or having learners it in ICT lessons. However, only schools A and D were keen for learners to access it in all lessons.

School C faced a lack of optical fibre in the locality that placed an obstacle in providing students with access of internet.

Headteachers' views towards the Ministry of Education in regard to ICT use

All of the headteachers agreed that the Ministry of Education required schools to be equipped with projectors and computer lab.

All the headteachers agreed that they ware of and had used a software before Classera called Nour.

All of the heads agreed that the Ministry of Education had no special interest in Classera use, they neither promoted nor discouraged its use.

The Ministry of Education had become recently interested in e-learning system.

All the heads agreed that the Ministry of Education had not provided enough ICT CPD for the teachers.

Headteachers' views toward parents in regard to Classera use

- All of the headteachers agreed that they provided parents with workshops about Classera.
- All felt that parents were happy to encourage their children to use Classera and agreed learners were using Claasera at home.

6.6 Observation

In order to understand teachers and learning in the schools, I carried out a series of observations in four schools. The observations took place after the teachers filled out the questionnaire. I was hoping to observe teachers who had been interviewed, but, as I mentioned in the earlier methodology chapter, that was not possible; access was the key

issue (for more information see Chapter 4). The observations took place in different months and that was mainly because the schools were located in different regions. Schools A and B were in the same region and the observation took place from 16 February to 19 February 2017. Observations in schools C and D took place between 10 January and 14 January 2017.

6.6.1 **Background information**

with respect to the nationality, 8 of the nine teachers were Saudi. I had intended to observe more non-Saudi teachers, but school E, an international school, did not give the permission to observe (for more information see Chapter 4).

with respect to subjects, I was able to observe different lessons in Arabic language, Religion, Science, English language, Math, History and ICT (see Table 6-12). I intended to observe two classes in each school but having realised the lack of internet access at school C, I became interested in how the ICT teacher in this school could teach without having internet access. Therefore, I observed three classes in school C. In fact, the ICT teacher brought the modem from the administration office and attached it to the computer during the lesson, but neither ICT tools nor the internet were used. In fact, the other two teachers (C1 and C2) used ICT more than the ICT teacher.

Table 6-12 the number, the nationality of the teachers and the subjects of the lesson that observed

Teachers	Subject	Nationality
School A1	Religion	Saudi
School A2	Science	Saudi
School B1	Algabra	Other
School B2	History	Saudi
School C1	Arabic language	Saudi
School C2	Science	Saudi
School C3	ICT	Saudi
School D1	Math	Saudi
School D2	English	Saudi
Total	9	

6.6.2 **The shape of the lessons and time spent at each stage**

Observing the classes helped me to identify the shape of the lessons. In fact, most lessons contained phases in which teachers **settled their classes, revised from the last lesson, introduced new points, explained and demonstrated the focus of the lesson, asked students to practise what had been taught, provided feedback** and finally **summarised the main points of the lesson**. I noticed that the first four parts were involved in nearly all of the lessons. However, when it came to the finish of the lessons the pattern was more mixed. Although these were identifiable phases in the lesson, the teachers tried to produce an integrated lesson so that each phase led naturally into the next phase.

The **settling stage** of the lesson consisted of greeting, registering, asking learners to open their notes to check their homework task and asking learners to focus on the learning. This settling stage took between 2 and 18 minutes. Some of the teachers (n=4) spent from two to four minutes while some others (n=3) took five to 6 minutes. For example, D1 greeted her learners, asked the learners to get their notes and textbooks and asked the learners to sit in their seats to begin the lesson. This procedure had been seen in all the classes.

However, only C3 and A2 spent much longer in the settling stage because they wanted they learners to move from one classroom to another (where C3 went to the computer lab and A2 to the science lab). This involved not only the movement of people but setting up the computer for the lesson. I noticed in all of the lessons that teachers did not check learners' homework in this settling in period and that might be because they had already received it through Classera. I did not know whether the teachers had been able to see the students' homework on Classera but they did not refer in the class to any homework they had received from Classera.

In the **revising stage**, the teachers tried to recap of what they have covered last time. This stage anywhere took between 2 and 14 minutes. Three teachers (B2, C1 and C2) took between 2 to 4 minutes to revise while other five teachers spent from 5 to 9 minutes. One teacher (C3) spent longer (14 minutes). The teachers who spent less time in this stage summarised main points of the previous lesson without testing learners' knowledge. In other words, these teachers did not ask learners questions about the previous lesson. In contrast, the teachers who spent more time did ask the learners questions that were related to the previous lesson to check if they understood it. The main reason C3 took the longest time in this part was because she tried to connect previous work into the new lesson.

The **introducing new learning** stage began with the teachers illustrating the main topic of the new lesson. This introducing stage took anywhere from 2 to 13 minutes. Most of the teachers (n=6) took 2 to 6 minutes while only three spent longer (8 to 13 minutes). The teachers used different methods to introduce the new topic such as telling a story, or providing a text from the Quran and clarifying the meaning of the words. In the maths lesson, B1 introduced her lesson by telling the learners to imagine they were in a shop and saw an offer for some clothes saying "take two for £23". Then she asked how much you

would pay for one item. This led to more work on fractions. In the science lesson, C2 showed the learners the nutrition label for some of the food products and explained their meaning. D2 introduced her lesson by summarizing the aims of the lesson.

The stage of **showing and explaining the new learning** meant that they tried to talk about the new topic in more detail. This explaining part took from 4 to 29 minutes. Most of the teachers spent more time on this stage, probably because it was considered the most important part of the lesson. Most of the teaches (n= 6) took 10 minutes and more, while only two teachers spent around 4 to 8 minutes. However, C1 skipped this stage by moving from introducing the new learning to the practicing part without further explaining about the new topic. She provided sentences that illustrated different Arabic tenses and asked the learners to notice what differences they could see between them. Students had to identify these tenses for themselves and from the learners' efforts the teacher was able to draw some conclusions. This teacher seemed to have a more inductive approach.

The four teachers who used ICT tools in this stage spent more time on explaining than did the others. In the history lesson, for example, B2 spent the longest in this stage and that was probably because she displayed a video with some background about the topic. This took about 12 minutes. D1's lesson was different. She divided learners in to three groups, gave them three iPads and had them use an educational game. During this period, she went around the groups, supporting them, listening to them and prompting them and at the various point she then addressed the whole class explaining some of the new learning and asking questions and getting feedback. She spent the rest of the lesson time in this activity and involved other stages such as practicing and feedback while learners were playing. This teacher seemed to use a more inductive approach. However, by the end of the lesson time the teacher had not covered all what she wanted to do. D2 spent 13 minutes, where 8

minutes was taken in displaying the video and the other five minutes explaining points to the class. Although B1 spent 14 minutes in this part, she did not use any ICT tool while explaining the new lesson.

In the **practice and feedback stage** the learners were provided with exercises and feedback to practise what they had learned. This stage took from 6 to 19 minutes. In most of the lessons what happened was that the teachers gave the people an exercise, then feedback, and then more exercise and feedback. This was slightly different in one lesson, where the teacher (A1) continued giving exercises and did not give the feedback until the end. There was a common approach: the teachers circulated, helped, prompted. More time was spent in the exercises than in the feedback. However, A2 and B2 did not provide this part for different reasons. For B2 the lesson time had finished and she had not finished yet with explanation part, while A2 had enough time but she skipped this part and decided to move to the summary stage.

The **summary stage** involved the teachers in highlighting the main themes or points, providing homework tasks and discussing any other issues arising. Most of the teachers (n=7) recapped the whole lesson briefly and provided the homework. A1 allowed the learners to start the homework in class to save time at home. This stage took from 2 to 11 minutes. Most of these teachers spent 2 to 6 minutes, while C1 and C2 spent longer. C1 took longer by asking the learners to summarize what they had learnt in a conceptual diagram. C2 took longer as she provided a worked example using the iPad application to calculate calories consumed per day. D1 and B2 did not find time to reach this stage and did not provide the homework task at all.

Table 6-13: the stages in the lesson and the number of minutes in each stage

The teachers in different schools	Subject	Settling	Revising	Introducing the lesson	Showing and Explaining the new learning	Practicing and Feedback	Summary	Others	Total
A 1	Religion	6	9	2	11 (including displaying and explanation	6 for practicing stage and five minutes for the feedback	6		45
A 2	Science	18 (went to the science lab)	6	5	10	Skipped it	6		45
B 1	Algebra	4	5	2	14	18 (including Practicing and feedback part)	2		45
B2	History	5	2	6	29 (including 12 minutes displaying video and 17 minutes for explanation	This will be explained next time		3 For connecting projector	45
C1	Arabia language	2	4	6 (second step)		19 Minutes (including explanation and feedback) (First step)	11	and three minutes to connect projector	45
C 2	Science	2	2	13	4	13 Minutes (including practicing and feedback)	11		45
C 3	ICT	17 (went to the computer lab)	14	4	8 minutes (including explanation, practicing and feedback)		2		45
D1	Math	4	8	8	25 (including explanation, practicing and feedback)		This will be explained next time		45 Minute
D 2l	English	5	5	8	13 including (showing video and explanation)	7 minutes (including practicing and feedback stage)	2	5 spent in trying to connect learners' iPads with the internet	45

6.6.3 ICT infrastructure that was available in the school and in the classroom

Through observing the classes, I was able to see which ICT tools were available in the schools. All of the schools had computers located in the computer lab for teachers and learners to use. All of the classes were provided with projectors, while school D was also provided with smart boards in all the classrooms. However, in the others smart boards

were available only in specialised rooms. Internet access was not available in school C, as noted earlier.

6.6.4 ICT tools, activities and material that the teacher used during the lessons

I was also interested in observing other issues such as the use of ICT, Classera, group work, and the teachers referring to the textbook while teaching. In respect to the use of ICT, most of the teachers (n=7) used the projectors to display videos, PowerPoint and pictures. For example, B1 used the projector to show the learners a video about the kings that were ruling a country. A2 tried to use the projector that was in the classroom but it was not working. Therefore, she went to the science lab and used the projector there to show the learners a video about atoms. The religion teacher, A1, used the projector to display a PowerPoint slide that illustrated the text from the Quran and the goals of the lesson and then used the projector to display a video that showed the learners a story related to the text. However, only few teachers (n=4) used the internet while teaching. For instance, D1 used the internet to connect the iPads so the learners could play the educational game that the teacher had prepared for that lesson. As mentioned earlier, A2 used the internet to show the learners a video from the YouTube clips. However, the teachers in school C did not access the internet at their lessons because of the previously discussed lack of internet access in the school at that time. B1 and C3 did not use ICT tools at all.

In respect to the use of Classera, none of the teachers accessed Classera during the lesson time. However, some of them (n=5) mentioned Classera in different situations. For example, A2 told the learners that the homework task and the video shown during the lesson would be available to them via Classera. The ICT teacher C3 asked the learners if

they found any difficulty while using Classera and offered to help to fix this. C2 told the learners that she would send them a link to the applications that they had used in the class so they could download the apps for themselves. However, none of the teachers in school B mentioned Classera at all. This might give an indication that these teachers were not using Classera as frequently as the others.

I was also interested to find out how Classera was used in the delivery of the homework. In fact, most of the teachers (n=7) discussed the homework tasks through PowerPoint presentation or by writing the questions up on the board rather than opening Classera. However, the same tasks were available in Classera and it was expected that students would send their homework back to the teachers through Classera.

In respect to the pedagogy, some of the teachers (n=5) used group work and some used more inductive approaches. This might indicate that the teachers were not wedded to traditional teaching methods. While all of the teachers referred to the textbook in their lesson, that was mainly in the practicing stage. This suggests the curriculum was framed by the Ministry of Education.

To summarise, these observations were useful for me because they showed that Classera was not being used as routine in lessons. It might be that Classera was used in some lessons and I had not seen it, but it is clear that Classera was not opened up routinely during the lessons. It seemed that Classera was something to be used outside of the classroom rather than inside during the lessons.

Table 6-14: The behavioural practice of each teacher

Schools	Did the teacher use or mention Classera at the class	Did the teacher use internet	Did the teacher use projector at the lesson	Did the teacher display Power Point	Did the teacher use Group work	Did the teacher refer to the textbook	Did the teacher mention Homework task at the lesson
A2	Yes	No	Yes	Yes	Yes	Yes	Yes
A2	Yes	Yes	Yes	Yes	No	Yes	No
B1	No	No	No	No	No	Yes	Yes
B 2	No	Yes	Yes	No	No	Yes	Yes
C 1	No	No	Yes	Yes	Yes	Yes	Yes
C2	Yes	No	Yes	Yes	Yes	Yes	Yes
C3	Yes	No	No	No	No	Yes	No
D1	No	Yes	Yes	Yes	Yes	Yes	No
D2	Yes	Yes	Yes	Yes	Yes	yes	Yes

6.6.5 **Summary of the findings of the observation data**

Nearly all the teachers were Saudi and different subjects were observed.

ICT infrastructure in the schools

All the schools located computers in the computer lab.

All the classes had projectors in their classes.

All the classes of school D had smart boards.

Not all the classes were connected with the internet.

Teachers' teaching practices

The lessons followed a broadly similar pattern.

The first four stages of the lesson were involved in nearly all of the lessons.

Towards the finish of the lessons, the pattern was more mixed.

There were examples of the teachers using more inductive approaches rather than instructional approaches.

Some of the teachers used group work.

All of the teachers referred to the textbook in their lesson.

Teachers' use of ICT

Most of the teachers were using the projectors to display videos, PowerPoint and pictures.

Two teachers used iPads.

Only a few teachers used the internet while teaching.

B1 and C3 did not use the ICT tools at all.

Teachers' use of Classera

None of the teachers accessed Classera during the lesson.

Some of the teachers mentioned Classera in their lessons.

None of the teachers in school B mentioned Classera at all.

Most of the teachers posted homework on Classera but also provided the questions during the lesson.

Chapter 7 Discussion of Findings

7.1 Introduction

This chapter integrates the findings from each method of data collection in order to draw attention to the consistency, complementarity and contrasts with respect to the research questions in the study. These integrated findings will be discussed in relation to the wider literature (chapter three) to show how my study fits into that wider view of technology. The main research question of the study was **Does Classera have a future in secondary schools in KSA**? This involved asking three sub-questions:

RQ1. To what extent do teachers use Classera in private and international Saudi secondary schools?

RQ2. What encourages teachers to use Classera?

RQ3. What constrains teachers from using Classera?

An exploratory and embedded mixed methods approach was used in addressing these questions. A semi-structured interview was first carried out with a Classera director to understand more about the program (see section 2.5.3). A questionnaire was then distributed to teachers (n=91) in five schools (see Chapter 4). In the second part of the study, the five heads and a sample of the teachers (n=14) were interviewed (see Chapter 6) and some classes (n=9) were observed (see page 189). All the teachers who participated in this study were female and teaching at secondary level. The data generated from these different methods addressed the issue of triangulation.

Triangulation refers to the comparison of different sets. Hammond and Wellington (2012) defined triangulation as “a process of reaching accurate measurement through comparing a set of readings” (p145). There are different forms of triangulation: triangulation of data over time (re-asking the same participants); triangulation of sources (interviewing people with different roles and asking them to describe the same events). Triangulation can be also used in many other ways, such as in the context where the researchers compare their findings with other studies or when the researchers compare their interpretation of data with that of the participants, a form of respondent validation (Hammond and Wellington, 2012). Modell (2009) and Hammond and Wellington (2012) agree that the contradictory and the complementary aspects should be considered as much as the consistency.

This study used triangulation of methods. As seen in the methodology chapter (see page 87), the questionnaire enabled me to get a broader picture about Classera. This was triangulated against the interviews to give me a deep picture. I was also able to carry out some observations which offered a credibility check of what people were saying with what they were doing. I was able to compare cases and this comparison enabled me, as seen in chapter five, to get a picture of types of schools. Within the cases, there was a triangulation of sources where teachers’ responses were compared with heads. It is important to remember that teachers and heads hold different positions and might not always agree. However, here there is in practice quite widespread agreement between them over the use of Classera. Another type of triangulation is triangulation against the literature: in my case I am comparing my results with chapter two about the use of VLEs and about the use of ICT (see Chapter 3).

7.2 RQ1. How and to what extent do teachers use Classera in private and international Saudi secondary schools?

All sources of data showed that Classera was being used by the teachers (see page 151). However, its use was differentiated by school (see below). The Directors of Classera had high hopes for radical change to education using the software. However, in practice its use was predominantly for making teaching more efficient rather than radical change. In looking at teaching and learning, most classes could be described as instructional in nature but involving interactive teaching.

In respect to the extent teachers are using Classera, the majority reported in the survey that they were using it every day or two to three days per week. However, by breaking down the heads' interview data, teachers' responses in the survey and observation data by schools (see pages181 and 189), all sources showed that the use of Classera varied. A consistent picture emerged that schools A, C and D were the highest users, while B and E were the lowest ones (observation showed that the teachers in school B were not using Classera as frequently as in other schools because none of the observed teachers mentioned Classera, while, as explained earlier, no classes had been observed in school E). The headteachers of schools A, C and D felt that most of their school teachers were using Classera frequently. The head of school B believed that her teachers would use Classera more frequently as they got used to it. The head of E mentioned that she made Classera use compulsory for her teachers and made it one of their duties to show they had used it. Observation data showed that teachers were unlikely to be using Classera in their lessons and none of the teachers did so. However, Classera was being used out of the classroom.

Thus, what is particularly important in this study is that schools could be divided into high users of Classera (A and D) and low users of Classera (B and E). A further school C shared

some of the characteristics of A and D though take up was lower than in those two schools.

In respect to how the teachers used Classera functions, findings from three sets of data (teachers' interview and questionnaire and observation, see pages 150 and 189) suggest there were particular functions, including Assignment, Video lecture, and Course material, that were more widely used. The most used functions appeared to be related to the giving of information. This was clear in the survey and in the interviews, in which teachers mentioned they used the Course Material, Video Lectures and Homework functions. Observation data confirmed that teachers drew attention to Classera use by suggesting pupils could access course material after the lesson and most of the teachers posted homework on Classera and reminded learners to access it through Classera. Teacher A2 explained to the learners that the video shown during the lesson would be available to them via Classera. Teacher C2 told the learners that she would send them a link to the applications that they had used in the class and that would be accessible via the Course Material function.

The wider use of Video lectures, Course material and Homework functions can be attributed to the fact that, in the normal course of their work, teachers were used to setting homework, selecting videos and producing handouts. By using Classera, they could communicate, add learning artefacts and links for their students. In other words, Classera was being used to enhance the work that teachers normally did and did not involve radical change other than to upload material and gain some new ICT skills.

The other functions that were less used were those that required teachers to do new kinds of work, such as Classera library to communicate with other teachers, Quizzes, recording lessons and uploading these lessons through Classera, using virtual classes, analytics and

communication tools. In other words, it was not part of their normal pattern of working to teach online or to interrogate online data. These functions required teachers not just to use ICT but to change the way they worked in their preparation and in their teaching. There was a consistent picture between two sets of data (teachers' interview data and questionnaire data, see page 150) that these functions were less used.

When it came to functions that particular teachers did not use at all, some teachers explained what had led them not to use Virtual classes, Homework and Discussion board. They reported that they did not have sufficient time. When it came to the homework function they explained that this was not used because the Ministry of Education required teachers to set learners tasks through their textbooks and to set homework by Classera was duplicating work.

A key conclusion from the VLE literature is that some functions will be used more than others. This was a consistent finding, see their summary conclusions in particular, in the studies by Pynoo et al. (2012) and Ofsted (2009). What this study contributes is a more in-depth understanding as to why some functions were more used than others. In particular, those functions that seem to integrate with an existing way of teaching are more often used.

As regards take up, it might be surprising to some people that VLEs were used as much as they were in the Saudi schools, given that that Saudi Arabia is a hierarchical society and is often seen as a very traditional society. However, this study adds to the literature by explaining the similarity of responses to VLEs in Saudi to those in the wider literature. Perhaps one reason for this was that my study concerned private and international schools. In fact, there have been other innovations in Saudi described in the literature (see page 3, Binothman's study, 2015) in which VLE use has been discontinued. So, in this respect the

widespread use of Classera was not expected. One possible reason might be that the study was concerned with private and international schools where there was perhaps more funding, or parents may have been more outward looking and more supportive of technology, or schools may feel a sense of competition which pushed them to develop their educational system. Alternatively, it might be that Saudi is a more innovative society than other people realize.

7.3 RQ2.What encourages teachers to use Classera?

Encouragement for using Classera existed at the teachers' level, at the school level, beyond the school level and through CPD. At the teacher level, the teachers themselves had relevant ICT skills, believed in the value of Classera use and its impact on teaching and learning. At the school level, there was infrastructure and effective leadership which helped create an environment that encouraged and increased the enthusiasm among schools' members. Beyond the school level were the Ministry of Education and parents which accepted the use of Classera.

7.3.1 At the individual teacher level

At the teacher level, the key issues were teachers' willingness to learn, teachers' ICT skills and teachers' beliefs.

Teachers' willingness to learn

What seemed to assist teachers in using ICT was the willingness to develop themselves professionally. This involved seeking help at times. The survey data showed that the most frequently cited source of help that the teachers received was Classera representatives, while more than half of the respondents claimed that they had received support also from manuals or online resources. A further question in the survey data showed that teachers

were interested in developing themselves professionally as they would follow the advice from more experienced people and tried to attend in-service events. The survey data showed also that the majority of the teachers believed they should develop their own learning but also seek help at times. All the interviewed teachers gave examples of how they taught themselves about the use of ICT and kept themselves up to date. The literature shows the importance of teachers' willingness to learn. In the Saudi context, Alzahrani (2016) found a lack of in-service training, so that the teachers relied on themselves more often and taught themselves about educational ICT tools. This seemed to be happening in my study too.

Teachers' ICT skills

All sources of data showed that the teachers had ICT knowledge and skills which played an important role in adopting Classera in the schools. Teachers' interview data showed that all of the teachers agreed that they used ICT every day for personal use and they used it also in their teaching. The teachers gave many examples of their use such as using iPads; searching for resources; using specific hardware and software; and displaying resources. The observation data showed that most of the teachers were using the projectors to display videos, PowerPoint presentations and pictures. Two teachers used iPads. Only a few teachers used the internet while teaching. The survey data showed that a high percentage of the participants found it easier to find relevant teaching materials over the internet rather than via textbooks. A further question in the survey showed that more than half of the respondents claimed that they had received support from manuals or online resources when using Classera. This widespread acceptance among teachers about using ICT in general and Classera in particular could be due to the informal support they received from their colleagues, their school head's perspectives and enthusiasm or the help that they received form Classera representatives.

In relation to the literature, ICT skills are seen as important in the take up of ICT (see page 75). For example, Saqlain et al. (2013) investigated the readiness of Saudi English language teachers to integrate use of ICT in their practice and found that teachers' with knowledge of using ICT tools were more willing to use ICT in their practices.

Teachers' beliefs about ICT and about teaching and leaning

All of teachers felt positively about the use of ICT and believed that ICT was important in their teaching. The interviewed teachers described the advantages they saw of using ICT. Some saw ICT as motivating learners and this was the most cited advantage. Other teachers found ICT helped them to enhance teaching and expand the limits of the curriculum. The survey data showed that most of the teachers encouraged their pupils to use the internet and create products through the computer, which indicates that teachers were interested in using ICT and believed in its positive impact on their pupils. The survey data showed that a high percentage of the participants found it easier to find relevant teaching materials via the internet rather than textbooks.

In regard to Classera, two sets of data showed that the teachers had positive beliefs and experiences about Classera use. In the survey, the data showed that all of the teachers agreed that Classera was useful and accessible. The majority of the teachers believed that Classera made learning more effective. A further question in the survey showed that most people also had positive experiences when using Classera. All of the interviewed teachers across five schools believed that Classera was helpful and they gave different examples of how Classera helped them. The data also showed that the majority of the interviewed teachers shared similar ideas about communication with learners through Classera. They were relaxed about email and they did not believe this was undermining of their status. Although, the interviewed teachers agreed that Classera did not change their teaching

practices, they found Classera a help. A further question in the survey showed that most of the teachers indicated that they had a high degree of confidence in their ability to use Classera and a strong feeling of self-efficacy.

All sources of findings showed that the teachers were often flexible when it came to teaching and they did not hold on to out dated ideas about teaching and learning. The large majority of the interviewed teachers highlighted methods that reflected modern teaching approaches. For example, the observed lessons showed the teachers willing to use more inductive approaches and to follow a pattern of exposition and interactive teaching. With pragmatic attitudes to teaching, they were more likely to be willing to try new ideas.

In relation to the literature, people who believe, particular software, will impact positively on their teaching and learning are more likely to use ICT. Buquoi et al. (2013), for example, found in their study that teachers with more positive beliefs about the values of using ICT to enhance learning tend to use technologies more frequently than others. In another example, Tondeur et al. (2017), who were concerned with understanding the link between teachers' beliefs and educational technology use, found that teachers who use ICT in their practice are able to alter their beliefs towards more constructivist beliefs and student-centered approach. This study supported previous findings in a more general sense by showing those teachers who perceive greater value in using ICT were more likely to use Classera.

7.3.2 **At the school level**

ICT infrastructure

Concerning the availability of hardware in the schools, all sources of data showed that the schools were equipped with projectors in each class, computers in the computer lab for teachers and learners to use and interactive white boards (see pages 159 and 185). This was confirmed by the schools' heads who agreed that the Ministry of Education required schools to be equipped with basic ICT tools including projectors and computer labs. However, the data showed different school policies in respect to the availability of internet at the schools, to allowing learners to have internet access and to bringing their own devices to the schools. The headteachers of schools A, B and D were more relatively open about the use of ICT and attempted to provide more ICT tools in their schools than the others. The survey data showed that schools A, B and D provided internet access in their computer lab, offered internet in classrooms and allowed learners to have internet access. During interviews, heads of schools A, B and D expressed more open attitudes about the use of ICT; for example, they allowed learners to bring their own ICT devices and to have access to the internet under the supervision of the their teachers. In the observation data, the teacher in school D divided learners into three groups, gave them three iPads and connected them to internet of the school. In schools A and B the teachers used the internet to show the learners a video from the YouTube clips. All the classes of school D had smart boards. However, teachers' interview data showed that there was a lack of good internet speeds in the schools and this will be discussed in more detail in the constraint section (see page 217).

In contrast, the data showed that schools C and E were more restrictive. In respect to School C, there was a consistent picture that there was a lack of internet access at this

school. The observation data showed that none of the teachers used internet during lessons. The survey data showed that in school C a very large majority of people found it difficult to access Classera. This was confirmed by the head teacher who reported that the school faced a lack of optical fibre in the locality, which was an obstacle to providing the school with a good internet connection. Although School E provided internet access in the computer lab and in the classroom for teachers to use in teaching, the survey data showed that the learners were not allowed to use the internet. However, I was not able to access the classes of this school to gain more information about it.

In relation to the literature, the accessibility of ICT is a major issue. Several studies showed the importance of ICT infrastructure in schools. For example, Garba et al.(2015) spoke about the use and the infrastructure of ICT in relation to 21th century learning and teaching approaches in Malaysia and found that the availability of a computer and overhead projector in the classroom for the teachers was an important factor that affected ICT integration. ICT infrastructure is an enabler. Albugami and Ahmed (2015) too found that there were differences between schools in regard to infrastructure (due to types of building) and this affected take up. In my study accessibility was bound up with policy so that openness to internet use was as important as having the internet in the first place. A similar point is made by Boulton and Waters (2015) who found that schools differed in their implemetation of VLEs and this was influenced by the school's vision.

Leading ICT

All sources of data showed that not only the encouragement and involvement of their schools leaders that prompted them to use Classera, but also headteachers' "personalities" encouraged their use of it. Teachers responded to headteachers who showed enthusiasm and interest in technology. All of the interviewed teachers using Classera said that their

school heads encouraged them. The survey data showed that more than half of the teachers claimed that they had received support from their school heads. However, the data also showed that the teachers in schools B and E received less support from their heads than those in other schools. This shows that the level of encouragement from each school head was different. For example, the head teacher of school A felt that she was energetic, she checked the teachers use frequently by looking at the Classera dashboard and she set clear consequences for the teachers who did not use it. However, she also wanted teachers to develop their own use of Classera and not rely on her. In contrast, the head teacher in school E was more directed in that she made Classera use compulsory for her teachers and made it one of their duties to show they had used it. However, the use in school E was still relatively low. The use of ICT is then encouraged both by sanctions and by encouragement and proactive learning culture.

In respect to heads' leadership, the data showed that the headteachers' ICT skills and their beliefs about ICT played a role in the take up of Classera. Positive beliefs led teachers to be more enthusiastic about the use of Classera. In respect to heads teachers' ICT skills, the interview data showed that all the headteachers were knowledgeable users of ICT and they used ICT every day for personal use. This helped the headteachers to understand the teachers' response to Classera. In respect to their beliefs, all the headteachers said that they brought Classera because they believed that it would serve their educational purposes.

In relation to the literature, there are several studies which showed the key role of school leaders and their positive impact on ICT integration in schools. In regard to VLEs literature, Grainger and Tolhurst (2005), for example investigated organizational factors that influenced teachers' use of LMS and found that perceptions of leadership was one of the factors that encouraged such use. Ofsted (2009) found that schools that showed a good

use of VLEs had headteachers who promoted a whole school approach. Passey (2010) also found that the presence of a positive, enthusiastic and coordinated strategic approach by a school leader was one of the conditions for successful integration. In the Saudi context, Al-Harbi (2014) argued that without a school leader who provided encouragement and sufficient support, a good working environment could not be achieved and teachers would not be motivated to use ICT in their practice. My study complements this wider literature by showing that the absence of appropriate encouragers could be a constraint.

Enthusiasm of the school members

The combined data showed that not only the heads teachers were enthusiastic about Classera but the teachers were too (see page 96). The survey data showed this was true for most of teachers across the five schools. However, the data showed that teachers in schools B and E came across as less enthusiastic and those in schools A, C and D, which had the highest number of high users, were the most enthusiast. My study showed a direct relationship between the enthusiasm of school leaders and the enthusiasm of the school teachers and vice versa. The literature is mostly focused on leaders rather than the teachers and the general environment in which teachers develop their use of ICT is not covered so well. Only a few teachers said students encouraged them to use Classera, by asking them to regularly upload resources. Teacher interview data showed that more than half of the teachers agreed that their students were interested in viewing the videos and pictures that teachers had uploaded. This suggests that only occasionally can learners be seen as encouragers for Classera use (in this study).

7.3.3 **Beyond the school level**

The Ministry of Education

The data showed that the Ministry of Education encouraged teachers to use Classera directly and indirectly (see pages 166 and 166). In terms of direct help that the teachers received, the survey data showed that more than half of the respondents claimed that they had received support from their supervisors. However, by looking at teachers' responses in each school it seemed that teachers in school C had received less support from their supervisors than other teachers. With respect to indirect encouragement, teachers' interview data showed that all of the teachers following the Ministry of Education curriculum said that supervisors evaluated their use of ICT when supervising their teaching. This could be seen as encouraging and this kind of top-down encouragement is often seen as important in the literature. Across the literature, many researchers have shown the key role of policy makers in successful ICT integration at the schools. Avidov (2018), forexample, identified factors that promoted the sense of empowerment among the school heads and found that ICT national policy was an external factor that enhaced such a feeling among principals. In relation to Saudi contexts, there was an agreement among researchers that the Ministry of Education asked teachers to use ICT in their daily practice in the classroom, for example Albugami and Ahmed (2015). Overall, policy makers were keen on the use of ICT but not specific in the way they were supporting Classera.

All of the interviewed heads showed they were aware of the Nour initiative run by the Ministry of Education (see page 185) and some teachers in the survey indicated that they had used similar packages before Classera. These past experiences may have made them more receptive to the use of Classera.

Parents

All sources of data showed that the acceptance and the involvement of the parents' encouraged not only the learners but also teachers to use Classera. The headteachers felt that parents were supportive. The teachers' interview data showed that parents in general were seen to be positive about ICT use and they were not an obstacle to their children's use of Classera. The data showed that the schools played an important role in persuading parents about their learners' use of Classera (see page 180). All of the headteachers agreed that they provided parents with workshops about Classera, illustrating the general ideas behind it, the benefits of using it and ways of using it. The survey data showed that more than half of the participants agreed that schools were providing workshops for parents, although they showed their agreement to different degrees. What the data showed is that teachers in schools A, C and D who had the highest number of high users, agreed that their schools provided frequent support in how to use Classera. A further question in the survey data showed that most of the teachers felt their school set clear guidelines with parents. In the survey data, more than half of the teachers agreed that parents had access to Classera. The interviewed teachers gave examples of parents' use of Classera. For instance, one teacher in school E said that a lot of parents used Classera rather than come to the school, while another teacher mentioned that she used Classera to inform parents about their child's absence which helped her to enlist parental support. The data showed that parents' acceptance of Classera affected children's use at home. All of the interviewed heads agreed that the learners were seen as using Classera at home.

Overall, the literature points to the importance of parental encouragement. Page 57 cites a number of studies which show the importance of parents' acceptance, views toward ICT and its impact on their children and teachers use of ICT. Ledbetter and Finn (2013), for example, found that the acceptance by parents of communicating across school boundaries

developed teachers' attitudes towards ICT use and promoted students' learning. In regard to the Saudi context, this study supports a previous one conducted by Binothman (2015) who found that Saudi parents encouraged their pupils to use VLEs and both teachers and learners reported that there was no parent refusal to allow children to use the system

7.4 CPD

CPD covers a range of levels as it involves activities outside of the schools, such as the input of Classera representatives, and inside the schools, such as the school leader's role in providing training. Also, at the individual teacher level, it reflects the willingness to undertake professional development activity.

All sources of data showed that the teachers had received training workshops in how to use Classera (see page 161). A further question in the survey showed that more than half of the teachers received one to two workshops about Classera, while a quarter of the respondents attended three to five sessions. With respect to the nature of the training, two sets of data (questionnaire and teachers' interview) showed that the workshops were sufficient, included a hands-on element, were comprehensive, addressed teachers' needs and focused on developing teaching and teachers' IT skills. However, the differentiation of the teachers' responses in the survey showed that the schools showed different patterns in respect to CPD itself. The teachers in school A, C and D, which had a large number of high users, were happier about the nature of training they received. On the other hand, the survey data showed that teachers in schools B and E, which had a lower number of high users, were less happy. It is believed that the survey encouraged the teachers to raise the shortcoming of the CPD they received more freely than did the interview.

CPD work best when it takes place over a period of time. In that respect school A, D and C had the advantage in that they were able to establish ways of working with Classera that new schools had not had time to do. CPD could take place formally and informally. In their interviews, the heads of schools A, C and D said that their teachers were using Classera more frequently while the principal of school B said that her school was just using Classera recently and she believed that they will use it more frequently over time. The observation data showed that teachers who had been using Classera for longer seemed to use it more. However, the observation data showed that none of the teachers in school B mentioned Classera at all. As mentioned earlier, the data from school E was limited and I was unable to observe their Classes.

In respect to the informal support the teachers received, the teachers showed in two set of data (interview and questionnaire) that they received support from other school teachers. All the interviewed teachers showed that if they had a problem with ICT, they could go to another teacher. The survey data showed that more than half of the respondents claimed that they had received support from ICT teachers. A further question in the survey showed that the teachers would more often turn to their colleagues if they wanted to improve their teaching.

The literature shows that teachers need a lifelong approach to professional development and this is more likely to exist within an environment that enhances teachers learning by engaging them in a range of formal and informal activities. Pachler et al. (2009), for example, agreed that informal and formal ICT CPD help teachers use technology. In relation to literature on VLEs, De Smet et al. (2012) found that perceived access to technical support affected positively both perceived usefulness and perceived ease of use in the

adoption of an LMS. This study supports previous research and argues that a combination of different types of CPD support helped in the take up.

7.5 RQ3. What constrains teachers from using Classera?

The triangulation of findings showed some difficulties that teachers faced while using Classera. These were related to concerns: at the teachers' level, at school level (ICT infrastructure, the school leadership and learners) and beyond the school level (Ministry of Education and CPD).

7.5.1 At the teachers' level

Surprisingly, there was little in the teachers' attitudes, skills and approach to teaching which could be said to be a constraint on using Classera. Of course, a small minority in each school did not consider themselves very confident with ICT and were less sure about the value of Classera. These were undoubtedly constraints, but the overall picture is that the contextual factors were more important than the teachers' attitudes. In general, the majority of the teachers in each school seemed to be positive about Classera, were not fazed by the level of IT skills needed and were willing to make an effort to use it. However, few of the teachers were willing to be embrace or even identify new approaches to teaching facilitated by Classera and this was a constraint.

7.5.2 At the school level

Learners

Two sets of data showed that learners were a constraint on teachers' use of Classera. All the interviewed teachers found a rejection of Classera by some students who saw ICT as a tool for fun rather than learning. Other teachers believed learners were "lazy"; for example, they suggested that learners believed that they had left learning behind once getting out of

school. Learners were seen as overloaded too and Classera gave them more things to do but little incentive to do them. The teachers' interview data showed that learners did not like virtual classes or receiving homework through Classera. Most of the interviewed teachers said that their learners did not like to use virtual classes because they would encroach on free time. Through the open-ended questions in the survey, one teacher in school E indicated that some learners were not interested in using Classera.

Across the literature, many studies have found there are variations in learners' attitudes and that learners do not share similar feelings towards ICT. Glušac et al.(2015), for example, distributed a survey for 318 high school learners in order to examine their opinions toward their use of social networks and their expectations towards using ICT in teaching. As with this present study, they found that learners who were active in the informal use of technology still did not see ICT as a tool for learning.

ICT infrastructure

The lack of good internet access affected teachers' use of Classera. Although, the schools were equipped with ICT tools and internet connection, the data showed that there was a lack of good internet speeds. All sources of data showed that school C was the only school that had no internet access at all. The head teacher of school C showed her interest in providing better internet access but mentioned that the school faced a lack of optical fibre in the locality that placed an obstacle in it. The data showed a large majority of teachers in school C found it difficult to access Classera in their school, while school B and school E also showed access difficulties. Through open ended questions in the survey, four teachers in school B found the availability and the speed of the internet at school constrained their use.

In relation to the literature, there is a large agreement that the lack of ICT infrastructure affects teachers' ICT use. Mumtaz (2000), for example, found that the difficulties of ICT infrastructure could frustrate teachers, limit their abilities to deal with ICT and eventually lead to resistance of using ICT in their teaching practices. In regard to the VLE literature, Passey (2010) found that it was necessary to include ICT infrastructure in procurement for the satisfactory implementation of a portal into school practices. It is important to note that the absence of encouragers is a constraint. This study is consistent with previous findings that internet access acted as a negative factor on teachers' use of Classera.

The school leadership

Despite the earlier evidence that some of the headteachers were engaged and encouraged their teachers to use Classers, three of the interviewed teachers found the leadership was unhelpful. For example, the teachers in school D were expected to use Classera every day but these teachers said that they would rather use it as and when they needed it and did not want that extra pressure. This was confirmed by the headteachers of schools A, D and E. The data also showed that the headteachers of school A and E set consequences for the teachers who did not use it, with the headteacher of school E going so far as saying she would terminate teachers' contracts and they would no longer work in the school if they were resistant to using Classera.

In relation to the literature, Blau and Presser (2013) investigated secondary school heads of e-leadership of LMS and found that monitoring teachers activities within platforms increased their use. Although, this study showed that school E monitored teachers' activities, the use of Classera in this school was still relatively low. As discussed earlier in the 'leading ICT' section (see page 209), the use of ICT needs to involve both sanctions and also encouragement. What these data add to the literature is that ICT implementation

needs sanctions, encouragement and understanding of teacher barriers. In line with these findings, Boulton and Hramiak (2014) suggested that headteachers should be aware of how to minimize the barriers to using new ICT tools and should provide time for teachers to develop their use of tools within their classrooms and provide greater opportunities for the teachers to share their experiences of using new technologies.

7.5.3 **Beyond the school level**

Ministry of Education

The data showed that Ministry of Education was not especially interested in teachers' use of Classera and this was experienced as a constraint, as confirmed by the heads (see page185). All the interviewed teachers who were following the Ministry of Education curriculum found restrictions in regard to the syllabus. In particular, teachers felt pressurized to complete the assigned curriculum in what was an unrealistic timescale. This pressured them and pressured their learners. Such pressure affected the quality of their teaching and dampened their enthusiasm for new initiatives such as Classera. Two sets of data showed that lack of time also constrained use. Four of the interviewed teachers described the difficulties in finding the time to upload links, handouts and videos. This was supported in the survey which showed that the teachers found it difficult to find the time to try out Classera. The interview data also showed there was some dissatisfaction with the role of the supervisors and the idea that they did not fully understand teaching or the contexts in which people worked.

The data showed also that that there was a lack of clear communication between the Ministry of Education and schools. As mentioned earlier, some teachers reported that they did not use the homework function through Classera because the Ministry of Education required learners to do tasks through their textbooks. This was confirmed by six of the

interviewed teachers as a constraint. One teacher also highlighted the same issue through open-ended questions in the survey.

Comparing to the ICT literature, many studies have found that, although policy makers are interested in ICT integration in schools, the support they offer is often patchy and untargeted and this is an obstacle for teachers and schools to use ICT meaningfully and successfully. Uluyol and Sahin (2016), for example, investigated Turkish teachers' ICT use and found it was limited because of the intensive curriculum. Uluyol and Sahin found that policy makers encouraged teachers to use ICT but they did not provide pratical support to enact change. Kozma (2008) found that the lack of either strategic or operational ICT policies by policy makers affected teachers' ICT use. This study supports previous studies in finding policy makers a hindrance.

7.6 CPD

Although, the picture of CPD itself was good and most teachers found it comprehensive, there were some teachers who found that training was not enough and, more importantly, in some schools the informal CPD was not as developed as in others. The role of Classera representatives was important because they gave support and guidance. However, there were some problems within the platform that Classera had not addressed and which made CPD difficult. For example, there were problems with the Arabic fonts, the process of creating texts, and limitations in Classeras' question bank and analytics. Some also complained that the rewards system was a blunt instrument. For example, teachers could be rewarded simply for logging on and uploading material without any regard to the reasons they were logged on or the quality of the material they were uploading. At a further level, the cost of Classera was an issue for schools and was leading some of the schools to look for alternative portals. The heads of school D and C said that they would not renew

the contract with Classera because they had found cost-effective alternatives. This would have consequences for CPD.

7.7 Does Classera have a future in secondary schools in KSA?

By addressing the three sub-research questions we can reach an answer to the main question posed above. The overarching conclusion is that Classera does have a future in secondary schools in KSA. One way of understanding this future is to understand the conditions under which Classera is either taken up or not taken up. There are different ways this can be done but the most usual is to suggest some kind of model.

Vanderlinde and van Braak (2010) address context to some extent by designing an E-capacity model from a school improvement perspective. They used E-capacity as a term implying that the ability of the school to optimise sustainable teacher level and school level conditions to integrate ICT effectively. They combined school level and teacher level dimensions. Four mediating conditions were included: school improvement conditions, ICT related school conditions, ICT related teacher conditions and teachers' actual use of ICT. Each of these conditions suggested a number of sub-conditions. For example, collegiality and participation in decision making were sub-themes of the leadership condition. This kind of model offers a much more rounded way of looking at the integration of ICT.

Kozma, (2003) provides another framework to understand educational change. Kozma focuses on 'innovative pedagogical practices that use ICT'. In his model, he embeds adoption of ICT in a set of levels which are at micro level (the classroom), at meso level (the school community), and at the macro level which refer to state and national entities. Kozma set in each level some factors and actors that mediate change. For example, Factors

that has been identified at the micro level were the characteristic for both teachers and the learners, the organization of the classroom and teachers' skills in using ICT. At the meso level, Kozma identified some possible actors included school leaders and parents and some possible factors which involved ICT infrastructure, school culture, school organisation and technical support. National policies and international trends have been identified at the macro level.

In my study, I have looked for a model that gives the holistic picture of what was happening in the take up of Classera, that is, a model that could enable me to look at micro level, meso level and macro level. To establish a foundation I found Al Ghamdi's thesis (2015) helpful, which in turn drew on Cartwright's earlier thesis. Cartwright and Hammond (2007) were concerned to take a 'bottom up' approach to explore the use of ICT and to offer a substantive theory on what was happening in one particular school which was seen as using ICT effectively to support teaching and learning. The study concerned a UK primary school which managed to develop its use of ICT around a strategy of 'fitting it in'. Methods involved observation of lessons, document analysis, interviews, and questionnaires with staff at the school. This study seemed relevant because as with my study it was looking in a holistic way at ICT and what was it about the school that led to the take-up of ICT. It drew attention to the various causal conditions; the contextual conditions; the intervening conditions and the consequences for staff and pupils associated with 'fitting ICT in'. The factors were helpful as it could be seen how the different findings fitted together. The study drew attention to what was important in the local context (teachers' behaviour and intentions) and what were causal conditions (for example, official requirement to use ICT, ICT infrastructure within school, supportive school environment). This breakdown helped in transferring the use of the model to other contexts. The model also set out strategies (active teacher involvement in ICT activities within their classes) so

that it was clear that this was not a predictive model but assumed that there had to be some expression of agency in ICT take-up.

In fact, both had derived from a grounded theory (GT) model that was developed by Strauss and Corbin (1998). Strauss and Corbin focused on explaining grounded theory, but it was the model I found helpful, not the GT approach itself. In my case I wanted to look at how actions or strategies had been developed to give rise to a phenomenon, i.e. how actions had enabled take-up to happen or not happen.

In fact, the value of the model is that it provides a mix of causality and agency by asking the researcher to focus on both conditions and strategy or actions. Secondly it forces the researcher to present a hierarchy of factors to show that some factors are causal (without their presence the phenomenon would not be able to take place at all) and some contributing (contextual and intervening conditions). Working from this model I constructed two scenarios, the first to show higher use of Classera and the second to show the lower use.

The phenomenon of higher take up of Classera

In two schools (A and D), there is a phenomenon of high take up of ICT. This is described as high take up in comparison with other schools in the study, albeit 'high use' is not as high as Classera might themselves had hoped. Neither does it match examples of very innovative schools reported in the literature

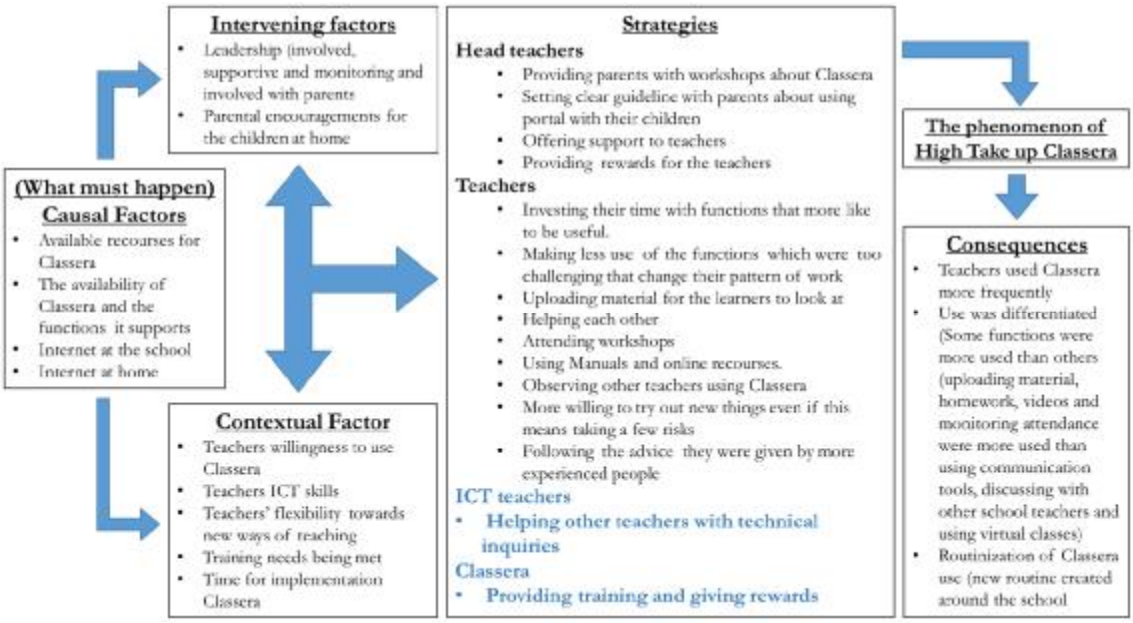

Figure 7-1: The phenomenon of high use of Classera

I will now explain each of these boxes.

Strauss and Corbin (1998) defined **Casual conditions** as "events or happenings that influence phenomenon" (p.131). In this study, the availability of Classera and the functions which Classera supports, the resources to cover the subscription of Classera and the availability of internet and hardware at home and at school were casual conditions for in the take up of Classera. Without such conditions it would be impossible for the schools to use Classera.

As for **intervening conditions**, Strauss and Corbin (1998), defined these as "those that mitigate or otherwise alter the impact of causal conditions on phenomena … often arising out of contingencies (unexpected events), which in turn must be responded to through a form of action/interaction." (p.131). Here these conditions were first that a leadership was involved and supportive of Classera. Leadership was enacted through strategies such as rewarding teachers and this will be explained later in the strategy condition section (see

page 226). Without leadership and parental acceptance, the schools were unlikely to use Classera even if they had it. In respect to the leadership, all the teachers in the high take up schools reported and agreed that their leaders were involved, supportive and encouraging. Secondly, parental encouragement for the children at home was also an influential intervening condition and the leaders took steps to address parental acceptance. Parents lived in a conservative society and many wanted clear guidelines about the use of the internet and to have safety and other concerns addressed. The schools did this by providing workshops for the parents about Classera use (see page 92). This led the parents to be more aware of Classera and more accepting of its use.

As for the **contextual conditions**, Strauss and Corbin (1998, p.131) defined these as "the specific sets of conditions (patterns of conditions) that intersect dimensionally at this time and place to create the set of circumstances or problems to which persons respond through actions/interactions." Teachers' willingness to use Classera, teachers' ICT skills, teachers' flexibility toward using new ways of teaching, meeting training needs and time for implementation were the most important conditions that contributed to teachers' actual practical use of Classera. Overall teachers were willing to use Classera even if it meant spending some time and patience in learning how to do so. The flexibility of the teachers in teaching was seen earlier in their acceptance of more modern pedagogical approaches. Training for teachers was comprehensive, sufficient, included a hands-on element and addressed their needs (see page 95). As seen earlier, ICT was used in the classroom and in the school in general. With regard to the time for implementation, the high take up schools had been using Classera for longer periods of time. Another potential contextual factor was that these schools had more Saudi teachers, but there was no evidence that this was a contextual factor operating on take up. Therefore, I do not judge its inclusion to be justified.

The **strategies** refer to the actions that had been undertaken by agency or people. Strauss and Corbin (1998) defined it as "represent[ing] what people, organizations, social worlds, or nations do or say. Strategic actions/interactions are purposeful or deliberate acts that are taken to resolve a problem and in so doing shape the phenomenon in some way'' (p.133). The strategies used by the heads involved providing parents with frequent workshops about Classera and setting clear guidelines with parents about using Classera with their children. They supported teachers to use Classera and rewarded their teachers for their frequent use. Regarding the strategies that had been developed by teachers, they invested their time to use some functions such as the Course material to upload their own presentations, and homework tasks and often they uploaded videos. On the other hand, they used a strategy of avoidance to make less use of other functions, which were too challenging. The teachers adopted collaborative strategies in that they helped each other and if they had a problem then they went to another teacher. They also received support from the ICT teacher. We have seen earlier that the teachers were also keen to: attend workshops that had been offered to them; observe other teachers using Classera; develop themselves at times by using manuals and online resources; and follow the advice they were given by more experienced people (see pages 94 and 102). Besides that, the teachers were also more willing to try out new things even if that meant they might take a few risks.

According to Strauss and Corbin (1998), **consequence** is " Whenever there is action/interaction or a lack of it taken in response to an issue or a problem or to manage or maintain a certain situation, there are ranges of consequences, some of which might be intended and others not.'' (p. 134). Several consequences had been found. Some teachers used Classera more frequently than others, new routines were created around the school and some functions were used more often than others (see page 88).

The Phenomenon of low take up of Classera

In two schools (B and E), there was a phenomenon of low take up of Classera, taken as relative to other schools in this study. Figure 7.2 summarizes the model analysis for them. Bullet points in different color show consistency with the high take-up model and not coloured shows distinctive features.

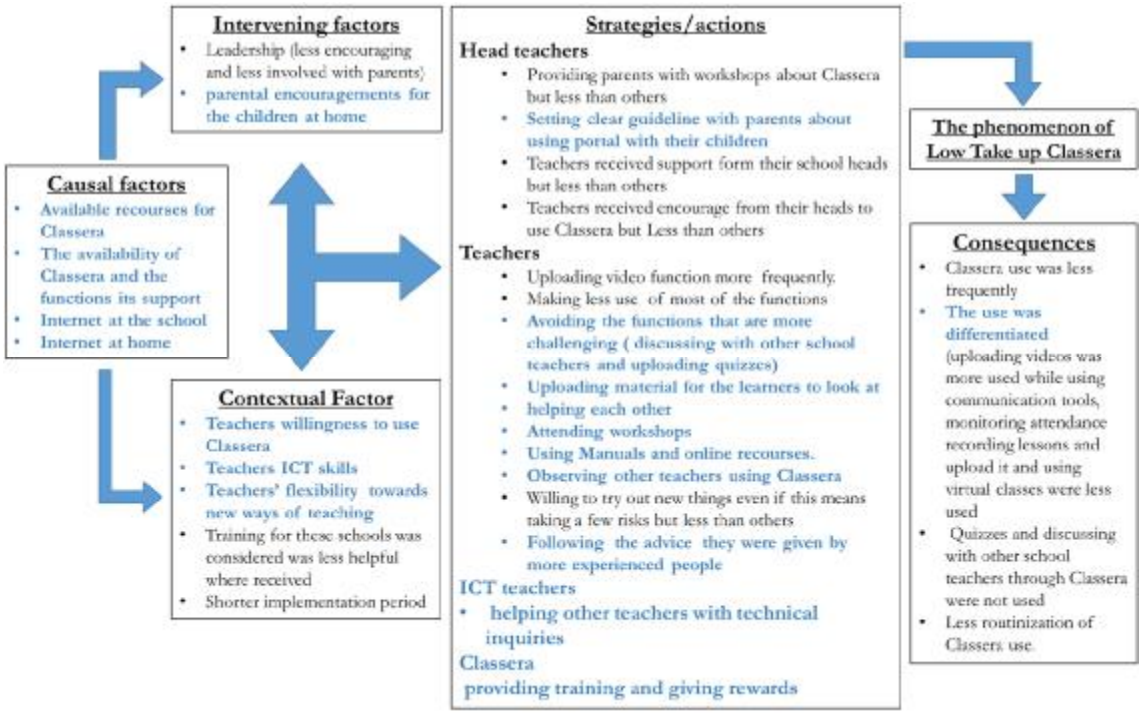

Figure 7-2: The phenomenon of low use of Classera

The causal conditions for these schools were similar to those for the high take up ones. However, there were some differences found in other factors. Among the intervening factors, leaders encouraged their teachers to use Classera but less effectively than in other schools. However, as in higher take up schools, heads in low take up schools involved parents in setting clear guidelines for parents and offered parents workshops about Classera use. There was also no reported differences between parents' acceptance and encouragement of their children to use Classera at home (see page 122).

Among the contextual factors, the time period and training offered reflected different conditions in the low-take up schools as opposed to the higher take up ones. Classera had been used for a shorter period of time and the training for these schools was considered less helpful where received.

In respect to the strategies that had been undertaken, heads in all schools had similar goals. However, the headteachers of low use schools were providing less than other heads. In other words, they provided parents with workshops, encouraged and supported teachers but less consistently than heads in the higher take-up schools (see page 92). The teachers in all the schools avoided using functions in Classera that were more challenging such as Classera library and uploading quizzes. As with the teachers in high use schools, teachers in low use schools helped each other, asked for help from ICT teachers, were willing to attend workshops that were offered to them, used manuals and online resources to develop themselves and observed other teachers using Classera. However, they were less willing to try out new things than were teachers in the other schools.

As for the consequences, these schools were using Classera less frequently. The teachers' use of Classera was again differentiated so that, for example, uploading quizzes and discussing with other school teachers through Classera library were not used (see page 112). These schools also showed less routinization of Classera use.

These models help us understand the conditions that are needed in order to develop the use of Classera. The models show why some schools used Classera more frequently than other schools. The key lies in time, leadership and training. More specifically, one of the major reasons for the lower take-up in some schools was short length of time they have yet had to embed Classera use in the school. There were other issues as well, which if addressed might lead lower take-up schools to become high take-up schools: the offer of

more effective CPD, a sharing culture but, above all, they needed time and to use time to reflect on what they needed to improve. In other words, time itself is not a facilitator of ICT use; people need to use time to reflect and commit to doing things better.

To summarize, the models I offer above are not deterministic – they show both conditions and strategies. However, they show the limits on take-up and help explain why take up is differentiated. The models can be used to suggest what needs to happen for the low use schools to become high use schools.

7.8 Educational change and ICT

This story of Classera needs to be seen in a wider issue about ICT and education change. There are two commonly-expressed views about ICT and educational change - one of which is very optimistic, the second of which is realistic or pessimistic. Papert is often seen as one of the early optimists. Papert (1984) claimed that "the computer is going to be a catalyst of very deep and radical change in the educational system" (p.2) because it would provide teachers with more opportunities to alter learning conditions by creating new association between learning and knowledge. While extreme, this idea of linking ICT to curriculum change has been present throughout the short history of computers in schools (Dias and Atkinson, 2001). Indeed, every new application of ICT stimulates an optimistic story about teaching and learning, e.g., Logo, Web 2.00, Massive Open Online Courses (Moocs). This is sometimes due to novelty but often because optimists are capable of seeing something in technology that particularly appeals to them, for example control over a learning environment (Papert, 1984) or anytime, anywhere learning in MOOCs (Mohamed and Hammond, 2018).

Pessimistic accounts are rarer. According to Hammond (2013), the case for pessimism is led by concerns about commercialism, lack of demonstrable impact, failure to fit with school.

Selwyn (2011) had particularly pessimistic views towards the use of technologies in educational settings. He argued that most people who saw the use of educational technologies as a positive project had an underlying belief in their potential to improve education;, Selwyn saw this belief as stemming from a genuine desire to make education better. However, Selwyn believed that ICT should be “a site of serious academic endeavours” and found that there had been a failure to engage with critical perspectives. Although there were repeated predictions of impending transformation, Selwyn saw that ICT tools were used inconsistently in educational settings and there was a lack of large-scale comprehensive “effect”(p.714). Selwyn did not deny the existence of the progress from the use of educational technologies in certain areas but these changes had not resulted in a fundamental amelioration of 'the human condition'. He then concluded that technological beliefs are more a matter of faith rather than a matter of fact.

Selwyn (2007) argue that although huge efforts had been made for using ICT as a main tool for teaching and learning, teachers and learners did not make frequent use of ICT. Selwyn highlighted the reasons for learners’ lack of use, including curriculum requirements and lack of time to engage with new technology. The demands of teaching made teachers too busy to change. Njenga and Fourie (2010) and Watson (2001) also argued that ICT could not be considered to be a catalyst for change without a commitment to changing learning approaches, teaching methods, and ways of accessing information; pedagogy needed to come first.

Meanwhile, in discussing e-learning, Njenga and Fourie (2010) asked techno optimists to think whether their focus in using e-learning should be on the 'e' or on the learning itself. They further pointed out that e-learning, or any other technology, should be considered as a means to obtain something and not an end in itself. They believed that the effective use of ICT had the potential to improve learning but they saw that much effort was needed to exploit technology sensibly.

The considerable constraints on innovation have led those promoting ICT to argue for pedagogical change with, for example, Sun (2000) arguing that teachers should change the way they teach in order to use technology 'effectively'. Hall (1995) believed that it was important to understand how educational change took place to implement ICT successfully. He further felt that educational change was multi-faceted and took in more than small changes in the daily activities of teaching and learning. Educational change was a much deeper notion than previously thought. This creates a problem for, as Fisher (2009) argued, it is difficult to change the pedagogical practices of teachers because these practices have been well established over time. Thus, he concluded that providing ICT tools does not always guarantee that the teachers are going to use them in the classroom. Hoban (2002) added that it was not easy to establish ICT use: deep and radical support for teachers was needed. Papert (1997) later acknowledged that pedagogical and organizational issues needed to be addressed in order to use ICT. Many schools are limited in the use they make of ICT, missing opportunities to enhance teaching and learning (Li and Wong, 2006).

Fullan (2015) who has long been one of the key writers on educational change, pointed out that implementing educational change includes three elements. These are, firstly, "the possible use of new or revised material (instructional resources such as curriculum materials, standards, or technologies)". Second, the use of new approaches of teaching and,

third, the possible alteration of beliefs (Fullan, 2015 p.28). Fullan suggested these three components needed to be considered when implementing any new programme and worked together for particular sets of educational goals to be realised.

Fullan reviewed the phases of the change process in the literature and found there were three main stages for the change process: initiation, implementation and then a continuation phase (also known as incorporation and routinization phase). In this final stage, the change might become built strongly within the system or it might simply disappear (see also (Berman, 1977). Fullan suggested that the phase of the implementation could take two to three years to put an idea of reform into practice. However, Fullan pointed out that the results could not be seen or expected until the change had been established. He further indicated that the process from initiation to routinization took time, but greater familiarity with managing change may reduce the timeline. He added that the more factors there were encouraging the implementation, the more change in practice would be achieved.

There is much that can be applied from Fullan (2015) to this study. Supportive factors and frequent use encouraged the teachers in the high take up schools to integrate Classera within their everyday routines and for that use to become embedded. Like Fullan, Berman and Mckaighlin (1977) found that projects may simply be discontinued without active and supportive heads. I believe in my study Classera, or something like Classera, will continue to be used because the heads are supportive. In regard to the phases of the change, the schools that showed high take-up seemed to be in the continuation phase. On the other hand, the low take-up schools seemed to be in the implementation phase and that was mainly because they were had only recently started using Classera and needed time to adapt.

There is also an argument in the literature about whether ICT offers a transformational (or radical) change in the nature of the educational process, often by proposing a learner driven curriculum. However, Fullan (2013) saw ICT integration as often focused on technical aspects rather than curriculum goals. In the current study, there was undoubtedly some incremental change to practice but little in the way of transformational change requiring a rethink of curriculum. In my view, there is unlikely to be such transformational change, although the significance of the incremental change should not be underestimated.

Through reviewing the literature, Fullan (2015) found that teaching has become much more difficult in recent years than in the past. In looking at recent studies (such as (Robert, 2015)) , he found that the teachers may feel over extended (or their work had been intensified) and this made addressing change even more difficult; there was not the time to spare for reflection and innovation. Saraason (1971) asked "If teaching becomes neither terribly interesting nor exciting to many teachers, can one expect them to make learning exciting to students?" (p. 166,167). In this study, aspects of teachers' work were over-extended. For example, they had to meet a time-pressured curriculum and their professional lives were regulated quite closely.

Fullan further highlighted that educational reforms often fail to achieve progress because they concentrated on the wrong part of learning (standards and assessment) and ignored the importance of teaching learners how to learn or to promote love for learning. He found that this focus on delivery rather than process led to diminishing enthusiasm and engagement. In looking at my study, the teachers were focusing more on using Classera to provide materials for their learners rather than using it to communicate with their learners which might be a reason that led learners be less enthusiastic to use such tools. In some cases, teachers really had noticed that there was a lack of enthusiasm among learners not

just for using ICT but for learning and this made the job of educational change much more difficult. This pointed to a whole school issue which schools themselves had not begun to address.

Fullan (2013) suggested a framework, Stratosphere, which consists of three elements including integrating Technology, Pedagogy, and Change Knowledge to reform education in the 21st century. He believed that this 'Stratosphere' would create highly engaging, technologically driven, and learner-centered environments. In respect to pedagogy, his framework emphasized the engagement of learners, the strong relationship between teachers and their pupils and focused on learner-centred and constructivist approaches to teaching. Fullan believed that this would help learners to think in creative ways and raise critical questions. In respect to the technology, he suggested using ICT as a 'platform' to give students a voice, allowing them to express their ideas and share their work with a real audience. Such pedagogy could develop learner voices and create a sense of empowerment. In respect to knowledge, Fullan (2013) defined change knowledge as about "the implementation of a theoretical frame. It involves putting ideas into place for the purpose of making positive changes." (p.430). Eight aspects have been identified by Fullan that play a key role in change knowledge, which are "focus, innovation, empathy, capacity building, contagion, transparency, elimination of non-essentials, and leadership". (p.430). The combination of these aspects would move change in the direction of establishing learning environments that are more engaged and promoted higher order and complex thinking.

What we see in this study is that the case study schools were not on the same page as Fullan. They were pragmatic in terms of teaching, they followed the curriculum guidance from the Ministry, they promoted an instructional curriculum. They were interested in innovation and included some interactive teaching but they were not seeking Change

Knowledge. There were modest and important changes in these schools over time, but there was not talk of transformational change. This is not unusual. Garba (2015) found that although Malaysian teachers acquired technological competence and used ICT frequently, the implementation of a national portal called Frog had not changed teaching and learning as envisaged. In my study, teachers used Classera to enhance the activities that they normally did and they did not take advantage of ways to alter the fundamentals of teaching and learning processes. Teachers continued to use the curriculum that has been set by the Ministry of Education and followed all other requirements, including assessments and tasks. The teachers would not use Classera, or any other tool, to change teaching and learning if they are overloaded, required to assess learners on tasks and required to follow prescriptive curricula. As Fullan (2013) suggested the curriculum needed to shift from focusing on set answers and tasks to make learning a "complicated conversation" between a teacher and their pupils.

7.9 Summary

This chapter has highlighted and discussed in detail the findings of the research questions that had been set in this study. We looked generally at how the study was carried out, how triangulation was used and how a model of higher and lower take up was developed. The chapter then concluded by answering the main question of the study. The discussion raised wider issues about ICT and education change. RQ1 asked how and to what extent teachers use Classera in private and international Saudi secondary schools. It was found that Classera was being used by the teachers but its use was differentiated by school. It was also found that some functions were more used than others. RQ2 asked what encourages teachers to use Classera. It was found that encouragers existed at the teachers' level, at the school level, beyond the school level and through CPD. RQ3 asked what constrains

teachers from using Classera. It was found that there were some difficulties, again at the teachers' level, at school level and beyond the school level. The answer to the main research question of the study was that Classera does have a future in Saudi secondary schools. Strictly, though, it is less clear whether Classera itself or some other broadly similar VLE will dominate. However Classera does not offer the transformational change to teaching and learning that technology optimists have dreamt about.

Chapter 8 Conclusions

This chapter concludes the thesis by first summarizing both the main findings of the study and the methods that were applied to address the research questions. This is followed by an explanation of how the thesis was organized. Then the strengths and limitations of this study are be highlighted, followed by a section of recommendations. Finally, the personal significance of the study is given.

8.1 Summary of the thesis and main findings

The study explored Classera as an educational portal in schools, through access to the perspectives of the heads and teachers, in order to see to what extent teachers used Classera in private and international girls' Saudi secondary schools and to investigate factors that encouraged or discouraged teachers' use of it. This study began by providing information about the Saudi educational system in general, the use of ICT in its schools, more information about Saudi teachers and introduced the five secondary school that acted as case studies. There followed a review of the literature related to VLEs, leading to a discussion of the factors that influenced ICT integration in schools. Thus, gaps in knowledge and critical research questions were identified, along with a general plan for addressing them. The study used a mixed methodology approach to address the main question, which was "Does Classera have a future in secondary schools in the KSA?" Three sub-questions were evolved in this study as follows:

RQ1. To what extent do teachers use Classera in private and international Saudi girls' secondary schools?

RQ2. What encourages teachers to use Classera?

RQ3. What constrains teachers from using Classera?

The nature of the research questions of the study required a deep understanding of schools' contexts in terms of: school community; principals' roles and leadership styles; the infrastructure of ICT; teachers' roles, practices and actual use of Classera; their beliefs about portal integration in their daily teaching practices; and the nature of ICT support. The study adopted a mixed method involving a survey questionnaire of the teachers, interviews with teachers and heads and observation of some classes. In this way, a holistic picture of Classera use was built up, including a view of the opportunities and difficulties teachers experienced. The mixed-method approach was used in this study in order to offer more trustworthiness and to enable a triangulation of participants' responses.

With regard to the first sub-research question, it was found in all the sources of data that Classera was being used, sometimes every day but often at least two to three days per week. However, breaking down the data by school indicated that use was differentiated. The headteachers' interview data, teachers' responses in the survey and observations data all showed that the use of Classera varied. A consistent picture emerged that schools A, C and D were the higher users, while B and E were the lower ones. The observation data showed that teachers were unlikely to be using Classera in their lessons.

In respect of how the teachers used Classera functions, the findings from three sets of data (teachers' interviews and questionnaires and observation) suggested there were functions, including Assignment, Video lecture, and Course material, which were more widely used than the other functions. The most used functions appear to be related to the giving of information. It was found that other functions (notably using the Classera library to communicate with other teachers, recording lessons and uploading them through Classera,

using virtual classes, analytics, monitoring attendance and using communication tools) were less used because they required teachers to do new kinds of work.

As for the second sub-research question, it was found there were some distinct encouragers for using Classera at the teachers' level, at the school level, beyond the school level and through CPD. In regard to the teachers' level, the key issues were teachers' willingness to learn, teachers' ICT skills and teachers' beliefs. At the school level, it was found that availability of ICT tools, leadership of ICT and enthusiasm of the school members were all factors in encouraging the use of Classera. Beyond the school level, it was found that the Ministry of Education, parents and CPD were encouragers too. The data showed that supervisors further encouraged teachers to use ICT and evaluated teachers' use of ICT when supervising teaching. Parents were positive and allowed their children to use Classera. In regard to CPD, teachers received workshops in how to use Classera and they reported that they were sufficient, included a hands-on element, were comprehensive, addressed their needs and focused on developing teaching and their IT skills.

Addressing the third sub-research question revealed that there were some difficulties that discouraged use occurring, again, at the teacher level, the school level, beyond the school level and with CPD. With regard to the teachers' level, a few teachers in each school did not consider themselves very confident with ICT and were less sure about the value of Classera; these were constraints. It was also found that only the minority of the teachers were willing to use Classera in a way that could enhance new teaching. At the school level, learners, ICT infrastructure and school leadership were seen by the teachers as sources of constraints. The teachers reported a rejection by some students who saw ICT as a tool for fun rather than learning. Teachers also said that the lack of good internet access affected their use of Classera. Although, teachers found their heads were engaged and encouraged

its use, a few teachers reported that leadership was unhelpful left them pressurized. Beyond the school level, the Ministry of Education and some aspects of CPD were seen as sources of constraints. In terms of the role of Ministry of Education, teachers felt pressurized to complete the assigned curriculum following an unrealistic timetable, they were not always satisfied with the role of the supervisors and they reported that supervisors did not fully understand the contexts in which they worked. They further mentioned that the Ministry of Education was not interested in teachers' use of Classera. Although, the majority of the teachers were happy about the CPD they received, some found training was not enough and were less happy about it.

The overall conclusion of the study is that Classera does have a future in secondary schools in KSA. Both pessimistic and optimistic scenarios regarding ICT take up exist widely, and almost independently in the literature but this study shows that the issue is much more complicated than that. In fact, there were modest and important changes in the schools over time, but not the transformational change that some expect technology to bring. Neither Classera nor ICT in general can by itself lead to radical change. Teachers used Classera to enhance the activities that they normally did rather than promote new ways of teaching. Classera will not ever become a transformational tool if teachers are overloaded, required to assess learners on tasks and required to use curriculums that are not appropriate. If radical change is desired there is a need to shift to make learning as a "complicated conversation" between teachers and their pupils.

8.2 Strengths of the Study

In terms of content, the research has contributed to an under-researched area of ICT take-up through the investigation of the use of VLEs in the Arab world, in this case Saudi Arabia. It has also explored the use of Classera in schools in which no study has been

undertaken before. It is methodologically robust. It has gathered data from different stakeholders: a Classera director, school heads and teachers. It reports on, and draws on for its design, a wide range of literature about attempts to use ICT in education. It has used a triangulation of data (survey, interviews and classroom observation) to enhance the validity of the findings. The research findings contribute by showing the importance of enthusiastic leadership, proactive teachers, and effective CPD. These findings are consistent with much of the literature, but by modelling the findings I am able to present a considerably more comprehensive picture of how IT implementation works and the consequences that flow from this.

8.3 Limitations of the Study

The study also has some limitations. Due to time restrictions, this study was limited to exploring only the teachers' use of Classera and has not included interviews with learners or their parents. With more time, I would also have liked to carry out more observations to achieve even greater reliability. The study focused on teachers at secondary level in all girls' private schools. In the future, I would like to extend the study to secondary schools in general in Saudi Arabia. A longer time frame would have given the opportunity to provide a longterm view on what happened in the low take-up schools. In fact, I will have an opportunity to return and check on uptake. A final shortcoming is that archive data on usage was not accessible. I asked the Classera representative if I could access the archives for schools on whatever terms she felt comfortable with, but not surprisingly she could not give me that permission. In the schools, headteachers could not give me access to the archives either which was again understandable but this meant that I was unable to carry out analysis of hours logged. I could have looked at how many people logged in for how long and where they logged in; as regards teachers, I could have seen how many documents

each had uploaded and who were the most frequent users of Classera among teachers. In other words, looking at these data would have enabled me to check some things which were not reported as used.

However, the headteacher explained that teachers might be able to show me examples of their work on Classera, which they did, and headteachers could and did refer to their own statistics on usage in the interviews. I believe I have gained a credible account of Classera use but there were some kinds of analysis that I could not undertake.

8.4 Contribution

My study makes several different types of contribution to the literature on the use of VLE's in teaching and learning. First, the empirical findings address a gap in the literature by providing insight into the use of VLE in KSA. Of course, there have been past studies in Saudi Arabia but very few studies have been conducted in the schools sector and many of these are limited by external factors. For example, studies were carried out on the use of Tatweer (see literature review page 18) which assessed teachers' and learners' acceptance of the use of a VLE and evaluated its potential usefulness for supporting teaching and learning. However, this study was carried out while Tatweer was in a trial stage and it was later discontinued. In other words (to the best of my knowledge), no study has been carried out in Saudi schools to investigate established VLEs in learning and teaching. Thus, I was able to report for the first time that there were marked similarities between the use of a VLE in Suadi Arabia and in other countries, i.e. VLEs, in this case Classera, can be used but their use is differentiated across teachers and across schools. In addition, some functions are more used than others, in particular some functions which are easier to integrate into everyday teaching such as uploading presentations but others call for changes in pedagogy e.g. online discussion.

Second, mine is a case study approach to the study of VLEs in school. Of course, the literature is not short of case studies of VLE but there is a shortage of the kind of comparative study conducted here in which low use and high use schools were identified and analysed. This enabled me to see different levels of ICT take-up and identify factors that encouraged some schools to use Classera more frequently than others. Methodologically, the study also provided a case of extended triangulation i.e. of interviews, survey and observation. The idea of using both interviews and survey is not new but the triangulation with observation is unusual. Thus, methodologically, the study addressed a gap by showing how observation data can uncover things teachers could not mention in the questionnaire and provided me with a credibility check through comparing what teachers had said to what teachers were actually doing.

Third, the study addressed a gap in the theorisation of technology use. As seen in the earlier literature, researchers tend to fall into optimistic and pessimistic camps and the literature is short of the kind of balanced appraisal of technology use in education that appears in my study. Furthermore, the literature tends to be overly descriptive and lacks conceptually rich explanations of technology. This study offered a model, founded on past work in social science, to explain the diverse factors which lead to take-up. Moreover, the model describes outcomes as a consequence both of factors and actions, and so accounts for both agency and structure, thus addressing a gap in the literature. This model is clearly described and can be transferred to other contexts. Of course, the model is not directly transferable but it is relatable and other readers and researchers can adapt it to their own contexts.

8.5 Recommendations

The overarching question of this study was whether Classera has a future in secondary schools in the KSA. This study indicates that it does, provided that care is taken, and I make the following recommendations for different audiences.

For academics

They might want to consider the integration of VLEs in schools at a holistic level rather than at the teacher level. To do this, academics might want to develop, or adapt, frameworks for understanding systems such as that in the model used here. Academics should consider the evaluation of VLEs over a longer time frame because take-up of any system does not remain static. Too often, the literature gives snapshots of ICT take-up that are distorted by the problems of novelty. Finally, academics should consider how to balance both optimism and realism in their accounts of technology use.

For policymakers

Ideally, we would hope to see policymakers working together with schools to develop ways of using VLEs that are appropriate for local settings. Ideally, policymakers will have a long-term view of change rather than ones based on their short-term occupancy of relevant ministries. Policymakers need to ensure schools have sufficient ICT infrastructure and provide opportunities for training of teachers in the use of ICT. Policymakers should consider how to make the curriculum better fit with technology for example by asking inspectors to raise the profile of ICT when observing teachers and adapting the school curriculum in appropriate ways. Realistically, it is unlikely that policymakers will be willing to undertake the full level of change that is needed. Ideally, policymakers will come back with a renewed offer on VLEs in state schools so that online communication and access to

learning material is open to all. In practice, it is likely that policymakers will continue to invest in ICT in school, and it should be relatively straightforward to offer relevant pre- and in-service training for teachers. There is a growing pool of expertise, including large numbers of teacher instructors who have studied overseas, with an interest in modernising the curriculum though ICT. However, really large-scale change is unlikely to happen in the short-term. There is inertia in the education system and worries expressed in wider Saudi society about technology use which make active promotion of VLEs unlikely. At a broader level, ideally. we would hope to see policymakers engage with the wider public about the benefits and importance of technology in education and life. This is likely to happen but only slowly and cautiously as there is much in Saudi Arabia as a traditional society which is hierarchical and inflexible.

For school teachers

Ideally, we would hope to see teachers use Classera in their classroom with the learners and to explore less used features, including group discussion, more frequently. This is only likely to happen with appropriate support from school leaders, policymakers and from Classera suppliers. Some of this support is in place but more needs to be offered. Some teachers will by themselves extend the use of Classera but most will not without support.

For school leaders

Ideally, we would hope to see leaders encourage their teachers to use Classera more frequently but also at the same time understand the barriers their teachers face. For example, much can be achieved by setting targets for use and monitoring whether those targets are met. However, school leaders need to give teachers some autonomy in how they use technology and allow for unplanned, bottom-up innovation. They should set the direction of ICT policy and offer both encouragement and sanctions on non-use. They

should develop their own ICT skills and consider the importance of providing teachers with sufficient time to learn how to use and apply technology. This means they should consider involving teachers in decision-making and perhaps start a whole school wider conversation about the nature of teaching and learning. They should continue to engage parents in school life and in the use of Classera including developing parents' ICT skills.

A lot of these recommendations are feasible. Teachers are not averse to using ICT and have 'modern' ideas about teaching. However, change needs to be managed carefully and headteachers need to start small rather than trying to turn schools upside down overnight. For example, rather than long, time-consuming CPD events, teachers could be invited to short show-and tell-events, when teachers have 10 minutes to show something they have learnt to do in Classera, after school. Headteachers will appreciate that in private schools, parents do expect to be involved and should be receptive to gaining parental support.

For parents

Ideally we would hope to see parents use Classera to support their children to keep using the system, and they should consider the value of providing computer access at home. They should consider the importance of developing their ICT skills to enable them to engage with their children's learning. This is quite feasible for many parents if they are offered support at their children's school and if they talk regularly with their children about their progress. Of course, many parents have busy lives and there is a limit to how much time they can give.

For Classera

The developers and suppliers of Classera might want to reorient the publicity towards more pragmatic uses of it in schools. They should consider that VLEs offer the schools more opportunity to make teaching and learning more efficient, rather than to support radical change. They should ensure that they continue to offer technical support. They should continue to offer training, as this has been well received.

If this is to happen, Classera needs to understand that it is important to build relationships with schools rather than just selling them the software. There is no commercial future in providing software that is not used to any large extent. Schools are going to look for cheaper alternatives or give up on their subscriptions. Commercial reality requires them to actively support the use of Classera, selling the software is only the first step.

8.6 Personal significance

At the start of this thesis, I introduced myself to give the context for my interest in technology. What I have learnt from writing this thesis is that the attitudes, concerns and practical needs of all stakeholders should be identified and addressed when the implementation of VLEs in schools is first considered. Implementation requires time, cooperation, a clear policy, continual assessment of its use and long term CPD related to ICT. It also requires effective leaders and willing, and some enthusiastic, teachers. However, successful integration does not necessarily mean that VLEs are able to transform the schooling system. On a personal level, I have undertaken a research journey. I understand how research is carried out and that research brings with it highs and lows. Overall, my general view of technology has not changed, but I have become more aware of its value and its use in society and less worried about its misuse. For example, I do control

what my children do with technology but I am more relaxed now. I want them to use technology in Saudi schools in the future. However, the experience of reading the literature has made me more critical of the ultra-optimistic views of the technology expressed by designers and certain academics.

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Appendices

Appendix A: Teachers use of Classera survey

Dear colleagues,

This survey is part of my PhD research about the implementation of classera portal in schools. The study investigates to what extent Classera is being used in schools, what problems and opportunities teachers experience in using it. Please note that all of the information collected in this survey will be kept confidential and will be used only for research purposes.

About your background

Years of teaching experience	
less than four	
four to eight	
9 or more years	

School type	
State school	
Private school	
International private school	

Nationality	
Saudi	
Other (please specify)……	

Classera	As you probably know, Classera has been introduced in your school. It is an educational software package that allows communication and access.	

About your personal use of Classera

Please choose what most describes you

Have you used a similar package before starting with Classera				Yes	No
Have you used Classera in your school				Yes	No
If you answered Yes, How often do you use it	Always	sometimes		Rarely	Never
How long have you been using it		One 2 years	3 4 years	5 and more years	

How frequently do you:

Response	Always (every day)	Sometimes (some days through the week)	Rarely (once a week)	Never
Put your own presentations in Classera				
Upload quizzes in Classera				
Upload homework in Classera				
Monitor attendance through Classera				
Use email or discussion board to communicate with learners				
Record lessons and upload to Classera				
Upload videos or films				
Discuss with other school teachers through Classera's library				

This section of the survey looks at the schools you are working at

Access

In the teaching room/rooms you use most of the time

Statements	Yes	No
Is there an IWB or other display device?		
Are there computers for students to use?		
Are there computers for teachers to use?		
Is there a computer lab for students?		
Does the lab have internet access?		
Do learners bring in their own multimedia devices?		
Do learners allowed to use internet at the school		

In your school do you have access to internet for all computers to use in teaching?

☐ Yes

☐ No

Learners' access (please choose one)

	Yes	No
Do people have individual log-in access?		
Can learners access Classera from home?		
In your experience, do learners access Classera from home?		

Parents access (please circle one)

Do parents have access to Classera?			Yes	No	
How often do school provides training courses for parents in how to use Classera portal	Always	Sometimes	Rarly	Never	
Do the school sets clear guideline with parents about using portal with their children?				Yes	No

Support

Getting help to use Classera

To what extent have you received help from the following when using Classera in school

Statements	Always	Sometimes	Rarely	Not at all
Classera representatives				
Your supervisor				
Other school leaders				
School principal				
Manuals / online resources				
ICT teacher				
Pupils				

Training

Statements					
Have you ever taken training courses in how to use Classera portal?			yes	No	
Who has carried out the training?		School		Classsera	
How many training sessions did you receive in using Classera?		1-2	3-5	6 and more sessions	
Have you found the training sufficient?		Yes		No	
Has the training included a hands-on element?		Yes		No	
Have you ever observed other teachers using Classera?		Yes		No	
Has the training addressed your needs?		Yes		No	
The training has been helpful	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
The training has been comprehensive	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
The training has focused on developing teaching as well as IT skills	Strongly agree	Agree	Neutral	Disagree	Strongly disagree

Environment

What proportion of teachers at your school would you say are enthusiastic towards using Classera in delivering the school curriculum? (please circle most appropriate)

All	Most	Some	Few	None

How enthusiastic you say the principal and other school leaders in your school are like Classera? (please circle most appropriate)

Very enthusiastic	Somewhat Enthusiastic	Slightly Enthusiastic	Not at all

What gets in the way of using Classera

To what extend do you agree or disagree with the following statements

Response	Strongly agree	Agree	Neither agree or disagree	disagree	Strongly disagree
I find Classera difficult to access in my school					
I find Classera difficult to use					
I don't think using Classera is time effective					
I don't feel confident using Classera in my lessons					
I don't think Classera benefits learners					
I don't know how to use Classera					
I don't know where to find Classera					
The learners don't like using Classera					
Other (please specify)					

Your use of ICT

How frequently do you get pupils to:

Response	Always (every day)	Sometimes (Some days in the week)	Rarely (once a week)	Never
Use the Internet?				
Create products with the computer such as texts, or presentations?				
Use email or discussion forums?				
Play a computer game				

Attitudes to Classera

Please indicate to what extent you agree or disagree with the following statements

(circle one for each statement)

Statements	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
It is difficult to find the time to try out Classera	SA	A	N	D	SD
Classera makes learning more effective.	SA	A	N	D	SD
Pupils enjoy lessons more when they use Classera than when they don't.	SA	A	N	D	SD
Classera is particularly useful in helping me to support the diverse learning needs of pupils.	SA	A	N	D	SD
Using Classera in my teaching saves me time.	SA	A	N	D	SD
Classera helps me to use a wider range of assessment tasks.	SA	A	N	D	SD
Classera is not relevant for every subject.	SA	A	N	D	SD
Classera helps me to personalise the learning of each pupil.	SA	A	N	D	SD
It is easier to find relevant teaching materials in textbooks than on the internet.	SA	A	N	D	SD
Classera can help in giving individualised feedback to pupils.	SA	A	N	D	SD
Classera helps attainment.	SA	A	N	D	SD

How effective do you feel you are in using Classera to support learning and teaching in the classroom?

Very effective	Quite effective	Not very effective	Not at all effective

If you wanted to improve your teaching, who would you turn to? (circle <u>one</u> number for each person)

	Most likely				Not at all likely
School principal	1	2	3	4	5
teacher colleagues	1	2	3	4	5
Resources	1	2	3	4	5
Your supervisor	1	2	3	4	5
Pupils	1	2	3	4	5

Attitudes to your own learning and professional development

Indicate on the scale to what extent each of the statements below corresponds with your attitudes and behaviours. Circle one number for each statement.

	Most like me				Least like me
I tend to follow the advice I am given by people more experienced than me.	1	2	3	4	5
I will not try something out unless I am fairly sure it will work.	1	2	3	4	5
I am willing to try out new things even if this means taking a few risks.	1	2	3	4	5
I try to attend school in service events offered in school	1	2	3	4	5

Beliefs about teaching and learning

Below are pairs of statements indicating beliefs about teaching and learning. For each pair, indicate which statement is closest to what you believe (circle one statement).

Instruction should start with teacher modelling and guided practice followed by practice and review.				Instruction should be organized around meaningful activities and projects.
Exactly what I believe	Somewhat like what I believe	I'm balanced between these beliefs	Somewhat like what I believe	Exactly what I believe

It is my responsibility to work out for myself how best to teach my class				It is my responsibility to take the advice of more experienced colleagues
Exactly what I believe	Somewhat like what I believe	I'm balanced between these beliefs	Somewhat like what I believe	Exactly what I believe

It is important to try new things out all the time in my teaching.				It is important for me to develop routines .
Exactly what I believe	Somewhat like what I believe	I'm balanced between these beliefs	Somewhat like what I believe	Exactly what I believe

Thank you for completing this questionnaire.

Appendix B: The interview schedule for the headteachers

Simple structure for the interview with headteachers

1. Can you tell me about your personal use of ICT?
2. Can you tell me about your use of ICT in your work in general? Do you need to use it at school or not?
3. Talk to me about your use of Classera?
4. Talk to me about the reasons for implementing an educational portal in your school?
5. Why Classera in particular?
6. What are the school visions and goals?
7. Do the use of Claasera considered one of these goals? Why?
8. Do you think the school will extend the contract for the next year? Why or why not?
9. Can you tell me about your beliefs toward the use of such educational portals in schools?
10. Can you tell me about your beliefs toward providing the school with unlimited internet access for teachers and learners?
11. Can you tell me about Ministry of education? Did they encourage/discourage/ help /not help the school to use Classera?
12. Did they encourage/discourage teachers to use it in their teaching practices?
13. Did parents have been in touch with Classera?
14. Can you tell me about things that help/not help the school to use Classera?
15. What do you believe is preventing the school from using Classera?

16. Tell me about your beliefs toward involving teachers in decision taking about the school?
17. Can you tell me about the teachers in your school, on the whole do they use Classera? which ones do you think are using it most ?
18. What technical support the school provides (if any), who or what is there to support the teachers?

Appendix C: Interview schedule for Classera director

I am conducting a doctoral research at education department. My research area is about using Classera at Saudi Arabia schools. Your participation is really appreciated. The purpose of this interview is to gather some information that will be part of my research study.

Note that all the information provided by you will be kept confidential and will not be used to identify you in any way. However, it will be used only for research purposes .

About Classera

Who developed Classera, why and when, why has it taken off?

Do you have other software you want to sell? Is that as popular?

Is this program designed specifically for Saudi Arabia is it used in other countries?

What future developments do you foresee?

Benefits

What benefits are there for the learners?

Do you think the learners Will find learning more fun using this program?

What does a teachers tell you are the benefits of using this program?

Are there any studies carried out into the benefits of this program?

What benefits are there for headteachers and administrators?

Take up

Are you especially interested in the school sector? [or higher ed?

Are there any state schools using this programme? How many?

How many private schools are using this programme? How many?

Do you think the schools will use the program for a long period?

What has been the response of the ministry of education to this programme?

Are schools using Classera for all its students or just some?

Is Classera designed with secondary schools in mind? Why?

Which type of school does it seem more popular with?

To what extent is the program being used in the schools that have adopted it? Where in or out of school?

Which parts of the programme seem to be more widely used.. which not… why?

support

Do the learners or teachers need particular training or support to start using the program?

What kind of difficulties do schools find in taking up the use the program?

Who provides the support?

Are there difficulties in access?

Do teachers want more content or to create their own content?

Access

Can you help me find schools to see Classera used?

Appendix D: Interview schedule for the teachers

Simple structure for the interviews with teachers

Date: Time:

Code number: nationality: Type of school

General information:

Tell me about your work here (how long, which subjects are you teaching)?

Main aspects	**Key questions**	**Prompts**
Your ICT use	1. Tell me about your personal use of ICT in general? 2. Can you tell me about how you use ICT in your teaching? Does it help/not help?	· How frequently do you use it in your teaching? · What type do you use most? Why? · What could you say about your ICT skills in general? I mean could you use ICT tools in your lessons or do you find difficulties in using it?
Personal use of Classera	3. Tell me about your use of Classera? What is help/ not help? 4. When you first use it?	· Have you used similar package previously? · Why are you using / not using Classera? · If it is not a mandatory, do you think you will still use it? Why or why not? · What parts do you tend to use more or less? why? · What have you benefited from using Classera?

Like and dislike about Classera	5. Are there any things you do not like in Classera portal? 6. Are there any things you like in Classera portal? 7. Would you suggest any development for Classera portal?	
Your learners use of Classera	8. Tell me about your learners' use of Classera ? what they like/do not like?	· How frequently do they use it? · What is the function your learners like to use in Classera? · If you upload the assignment in Classera, how many students answer it through Classera, majority of them or only few? Why or why not? · Do your learners prevent you from using Classera? Why?
Beliefs and attitudes toward Classera use	9. Do you think Classera helps you / helps your students, what helps / gets in the way of using it? 10. Do you think parents help or not help in using Classera or they are not an important consideration?	
Beliefs about teaching and learning	11. What is the best teaching approach do you belief work best with your learners? Why? 12. What is your attitude towards student-centred approach? Do you think is it an effective method? Why or why not?	· Do you think involving learners in their learning process will improve their performance? · Do you think putting learners in group tasks increase their learning? Why or why not? · What is the best role do you think it works best with your learners? Why?

	13. With the use of Claasera, do your teaching practices has changed? If yes? How?	· Do you think using emails and discussion board with learners improves learning?
School infrastructure	14. Tell me about ICT infrastructure in your school? What is available/ not available/ gets in the way of using it?	· What is the most common technological tools used in your school? · How would you assess the computers in your schools in terms of quantity, quality and their availability to use? · Do teachers and learners bring their own computers in to the school? If your answer is no, is there computers can you and your learners use it any time during the day in your schools? Is there any problem in this regard? · Does the computers in your school connected to the internet? If yes, can you and your learners have access to the internet? Is there any restriction in this regard? if yes, to what extend? · Do you and your learner access Classera portal at school or do you use it usually at home why or why not? · Is there any difficulties in your school that prevent you and your learners from using Classera?
Training	15. Tell me about training courses of ICT you attended? What is help/not help?	· Do you received sufficient number of ICT training courses in your shools?

		· Do they satisfy your needs to use ICT? If no how you gain ICT skills? · Have you trained how to use Classera? If yes, Do they satisfy your needs to integrate Classera portal in to the teaching and learning process?
ICT policies	**16.** Can you tell me about your supervisor and your use of Classera? Do they encourage/discourage/ help/ not help you to use Classera in your teaching practices? How and what?	· Is there a link between what your supervisors ask you to do with what the school ask you to do with Classer portal? Or do you find difficulties to cope with both? If yes how? · What are the main things do your supervisors check for? · Do your supervisors accept your notes if it is written through Classera or do you need to rewrite in your teaching notes? · Do your supervisors restricted you to write assignment and tests in paper or do they allow you to upload it in Classera?
leadership	17. Tell me about your school's leaders and your use of Classera. Do they encourage/discourage you to use it? 18. How involved is your school's leader? 19. Tell me about you school community, does it encourages 20. Discourages you to use Classera?	· Their role in supporting the use of ICT in your school? Does your school leader prescribe to you ICT tools that are available in the school and how to use It? · Their role in supporting the integration of Classera portal in to teaching and learning process? · Their flexibility to involve you in decision-taking in your school?

		· Have you used Classera with your school leader? If yes how frequently? · Do you think the leadership style of your school prevent you from using Classera?
Culture	21. Talk to me about your belief toward use of internet in schools? 22. Do you think using it in schools interrupts and disturbs the learners? Why or Why not? 23. Do you think using discussion board and emails with the learners diminish your power?	
Opportunities and constraints	24. What do you believe is preventing you from using Classera portal? 25. What do you believe is encouraging you to use Classera? 26. Talk to me about any difficulties that didn't allow you to use Classera? 27. What are conditions that allowed you use Classera?	

Thank you for your cooperation

Appendix E: Observation schedule for the teachers

Back ground information	
Code of the school:	
Date: / /2017	
Subject:	
Lesson minutes:	
Teacher nationality:	

What to observe	**What is noticed through observing the school**	**Comments**
ICT infrastructure in the school	What are ICT tool available in the school Projectors Computers interactive board Other devices…….	
	Where are computers located in the school? In majority of classrooms Some of the classes Only in the computer lab no computers Other place ……	
	Where can internet be used in the school In the majority of Classes Some of the classes Only in the computer lab no access to internet Only for administration work other place……	
	What are ICT tools available in the classroom? Computers Projectors Interactive board Other devices…..	
Teacher's Pedagogic practices	Settling in eg greetings, register How many minutes teacher spend in this part:	
	Reviewing eg homework and previous lesson	

	How many minutes teacher spend in this part:	
	Introducing the new learning How many minutes do teacher spend in this part:	
	Showing, explaining and describing ….. How many minutes teacher spend in this part :	
	Practicing How many minutes teacher spend in this part :	
	Feedback How many minutes teacher spend in this part :	
	Summary How many minutes teacher spend in this part :	
	Finishing How many minutes teacher spend in this part :	

	Is the teacher used ICT tool during the lesson? Yes, what is it ……. How did she use it? ,…… …… …… ……... No	
	The material the teacher used How often did the teacher refer to the text book : how essential other text book:	
	Is there any group works a mong learners during the lesson? Yes No	
	Do the teacher produced her own power point Yes No	
	Do teacher used Classera at all ? Yes No What they used it for:	
	Do the teacher distributed work sheet in the lesson? Yes No	
	Do teacher provided assignment task at the last of the lesson? Yes No	

Appendix F: Request letter of school's participation

Dear headteachers,

I am conducting a PHD research at Warwick University in the UK. The main aim of my study is to investigate the use of educational portal (particularly Classera portal) in Saudi schools to examine to what extend it is being used and what problems and opportunities teachers experience. Thus, teachers' participation to this research will be very important. I would be grateful if you could assist the research by giving me the permission to distribute teachers' survery and some observations and interviews might take place. Note that all the information data will be used only for research purpose and school's names will not be shared.

Please feel free to contact me if you have any more concern
i.alhujayri@outlook.com

Wish you all the best
Israa

Appendix G: Summary of teachers' responses in the questionnaire

The following tables show the summary of teachers' responses in all of the survey questions (Appendix A)

Teachers' background and their use of Classera

Teachers responses in the survey	School A	School B	School C	School D	School E
The number of Saudi teachers	66.7	45.5	100.0	100.0	26.7
The number of other nationality	33.3	54.5	0	0	73.3
Teachers with less than four years experiences	55.6	48.5	36.4	64.3	26.7
Teachers teaching 4 to 8 years	27.8	30.0	54.5	35.7	60.0
Teachers teaching 9 or more years	16.7	21.2	9.1	0	13.3
How long the teachers used Classera (who said three to four years)	27.8	3.0	27.3	28.6	0.0
Have you used a similar package before starting with Classera	33.3	24.2	0.0	35.7	26.7
Have you used Classera in your school? Who said yes	94.4	81.8	100.0	92.3	86.7
Teachers who used Classera always and sometimes	100.0	55.2	72.7	78.6	64.3
Teachers who reported they put their own presentation in Classera always or sometimes	80.0	25.0	45.5	69.2	28.6
Teachers who reported they uploaded quizzes in Classera frequently (always or sometimes)	35.3	6.7	54.5	38.5	8.3
Teachers who reported they upload homework frequently (always or sometimes)	94.4	30.0	72.7	71.4	61.5

Teachers who reported they upload monitor attendance frequently (always or sometimes)	64.7	3.4	9.1	38.5	0.0
Teachers who reported they use communication tool frequently (always or sometimes)	25.0	40.0	18.2	38.5	28.6
Teachers who reported they recorded lessons and uploaded it to Classera frequently (always or sometimes)	52.9	21.9	30.0	69.2	35.7
Teachers who reported they uploaded videos to Classera frequently (always or sometimes)	100.0	71.9	72.7	83.3	69.2
Teachers who reported they discussed with other school teachers through Classera library frequently (always or sometimes)	29.4	6.7	9.1	38.5	7.1

Access

Is there an IWB or other display tool	100.0	90.0	81.0	100.0	100.0
Are there computers for the learners to use	88.9	90.9	72.7	85.7	80.0
Are there computers for the teachers to use	88.9	100.0	81.8	100.0	93.9
Is there a computer lab for students	100.0	96.9	100.0	100.0	93.3
Do the lab have internet access	100.0	96.9	9.1	100.0	92.9
Teachers who said learners could bring in their own multimedia devices in to school	38.9	37.5	54.5	100.0	6.7
Teachers who said learners were allowed to use internet at the school	61.1	60.6	9.1	100.0	46.7
Do teachers have access to internet for all computers to use in teaching?	100.0	90.0	0.0	100.0	66.7
The teachers who agreed that learners have individual log-in access	100.0	100.0	100.0	100.0	100.0
The teachers who agreed that the learners could access Classera form home	100.0	100.0	72.7	100.0	100.0
The teachers who agreed that the learners use Classera from home	100.0	93.9	81.8	100.0	86.7
The teachers who agreed that the parents had access to Classera	81.3	50.0	100.0	100.0	86.7
The teachers who agreed their school sets clear guideline with parents about using portal with their children?	87.5	79.3	63.6	100.0	78.6
The teachers who agreed that their school provided training courses for parents frequently in how to use Classera portal (who said alwayse and sometimes)	81.3	27.3	36.4	70.0	25.0

Training

Have the teachers ever taken training courses in how to use Classera portal? Who said yes	94.4	96.9	100.0	92.9	86.7
Have the teachers found the training sufficient? Who said yes	94.4	59.4	100.0	92.3	85.7
Has the training included a hands-on element? Who said yes	100.0	90.6	90.9	84.6	92.9
Have teachers ever observed other teachers using Classera? Who said yes	52.9	21.9	27.3	57.1	66.7
Has the training addressed teachers needs? Who said yes	100.0	59.4	100.0	69.2	71.4
Who has carried out the training? Who said the school	50.0	57.6	45.5	61.5	57.1
Who has carried out the training? Who said Classerra	25.0	18.2	0.0	15.4	14.3
Who has carried out the training? Who said Ministry of Education	0.0	3.1	0.0	0.0	0.0
Who has carried out the training? Who said Classera and the school	25.0	18.8	54.5	23.1	28.6
How many training sessions teachers received in using Classera? who said 1 to 2	16.7	100.0	45.5	78.6	46.7
How many training sessions did you receive in using Classera? who said 3-5	61.1	0.0	54.5	14.3	40.0
How many training sessions did you receive in using Classera? who said 6 and more	16.7	0.0	0.0	0.0	0.0
The training has been helpful? Who agreed	94.4	71.9	100.0	85.7	80.0

The training has been comprehensive? Who agreed	83.3	53.1	100.0	85.7	53.3
The teachers who agreed (strongly agreed or agreed) that the training has focused on developing teaching as well as IT skills	88.9	50.0	90.9	78.6	71.4
Environment					
What proportion of colleagues at school would teachers say are enthusiastic towards using Classera in delivering the school curriculum? Who said All or most	83.3	71.9	90.9	71.4	46.7
How enthusiastic teachers say the principal and other school leaders in their school are like Classera? who said very or somewhat enthusiastic	100.0	90.6	100.0	100.0	86.7

What gets in the way of using Classera

Teachers who agreed that they find Classera difficult to access in their school	27.8	46.9	81.8	7.1	46.7
Teachers who agreed that they find Classera difficult to use	11.1	6.3	0.0	7.1	33.3
Teachers who agreed that they don't think using Classera is time effective	22.2	3.0	45.5	7.1	20.0
Teachers who agreed that they don't feel confident using Classera in my lessons	16.7	9.4	9.1	7.1	13.4
Teachers who agreed that they don't know where to find Classera	5.6	0.0	0.0	0.0	6.7
Teachers who agreed that they don't think Classera benefits learners	16.7	6.3	27.3	7.1	6.7
Teachers who agreed that they don't know how to use Classera	11.1	0.0	0.0	0.0	0.0
Teachers who agreed that they The learners don't like using Classera	38.9	15.6	90.9	7.1	13.4

Teachers' use of ICT and their attitudes to Classera

How frequently do teachers get pupils to Use the Internet ? Who said always and sometimes	77.8	78.1	90.9	85.7	66.7
How frequently do teachers get pupils to create products with the computer such as texts, or presentations? Who said always and sometimes	50.0	59.4	100.0	78.6	66.7
How frequently do teachers get pupils to use email or discussion forums? Who said always and sometimes	44.4	43.8	36.4	57.1	33.4
How frequently do teachers get pupils to play a computer game? Who said always and sometimes	50.0	21.9	9.1	57.1	26.6
The teachers who agreed that is difficult to find the time to try out Classera	16.7	34.4	54.5	0.0	46.7
The teachers who agreed that Classera makes learning more effective.	83.3	81.3	72.7	78.6	86.7
The teachers who agreed that pupils enjoy lessons more when they use Classera than when they don't.	38.9	46.9	54.5	50.0	46.7
The teachers who agreed that Classera is particularly useful in helping me to support the diverse learning needs of pupils.	38.9	43.8	54.5	71.4	33.3
The teachers who agreed that Using Classera in my teaching saves me time.	33.3	50.0	45.5	71.4	40.0
The teachers who agreed that Classera helps me to use a wider range of assessment tasks.	72.2	51.5	45.5	64.3	53.3
The teachers who agreed that Classera is not relevant for every subject.	27.8	24.3	0.0	7.1	26.7

The teachers who agreed that Classera helps me to personalise the learning of each pupil.	55.6	53.1	54.5	85.7	40.0
The teachers who agreed that It is easier to find relevant teaching materials in textbooks than on the internet.	27.8	27.2	36.4	42.9	6.7
The teachers who agreed that Classera can help in giving individualised feedback to pupils.	83.3	75.0	72.7	64.3	66.7
The teachers who agreed that Classera helps attainment.	72.3	60.6	54.6	71.4	40.0
How effective teachers feel they are in using Classera to support learning and teaching in the classroom? who said very and quiet effective	72.2	72.7	63.6	64.3	60.0
Teachers who said they most or somewhat likely turn to the school principal if they wanted to improve their teaching	38.9	36.4	0.0	14.3	33.3
Teachers who said they most or somewhat likely turn to other school teachers if they wanted to improve their teaching	50.0	60.6	81.8	71.4	73.3
teachers who said they most or somewhat likely turn to resources if they wanted to improve their teaching	72.3	84.9	90.9	78.6	80.0
The teachers who said they most or somewhat likely turn to their supervisors if they wanted to improve their teaching	72.3	63.7	45.5	57.1	66.7
The teachers who said they most or somewhat likely turn to their pupils if they wanted to improve their teaching	22.2	30.3	36.4	35.7	40.0

Teachers' Attitudes to their own learning and professional development and their beliefs about teaching and learning

The teachers who said that this statement exactly or somewhat like what they do tend to follow the advice I am given by people more experienced than me.	88.9	90.9	100.0	92.9	86.7
The teachers who said that this statement exactly or somewhat like what they do (I will not try something out unless I am fairly sure it will work.)	55.6	66.7	72.7	78.6	66.7
The teachers who said that this statement exactly or somewhat like what they do (I am willing to try out new things even if this means taking a few risks.)	77.7	48.4	54.5	71.5	53.3
The teachers who said that this statement exactly or somewhat like what they do (I try to attend school in service events offered in school)	88.9	81.8	100.0	85.7	86.7
Teachers who exactly or somewhat believed Instruction should be organized around meaningful activities and projects.	33.3	42.4	0.0	28.6	33.3
Teachers who exactly or somewhat believed Instruction should start with teacher modelling and guided practice followed by practice and review.	5.6	0.0	0.0	7.1	6.7
Teachers who said they believed between two previous statements	55.6	54.5	100.0	64.3	60.0
Teachers who exactly or somewhat believed It is their responsibility to take the advice of more experienced colleagues	5.6	0.0	0.0	0.0	0.0

Teachers who exactly or somewhat believed that it is my responsibility to work out for myself how best to teach my class	38.9	15.6	0.0	35.7	46.7
The teachers who believed between two previous statements	50.0	84.4	100.0	64.3	53.3
Teachers who exactly or somewhat believed that it is important to try new things out all the time in their teaching.	55.5	50.0	72.7	57.1	73.3
Teachers who exactly or somewhat believed that it is important for them to develop routines	0.0	0.0	0.0	0.0	0.0
Balanced between previous two statements	38.9	50.0	27.3	42.9	26.7

Appendix H: Interview transcript of one of the teachers in school B

I am conducting a doctoral research at education department. My research area is about using Classera at Saudi Arabia schools. Your participation is really appreciated. The purpose of this interview is to gather some information that will be part of my research study.

Note that all the information provided by you will be kept confidential and will not be used to identify you in any way. However, it will be used only for research purposes.

Tell me about your personal use of ICT in general?

I use Twitter and Facebook every day and I do not think we can live without using ICT. I was worried about anything new with technology but after engaging with computers for myself I like to experiment with new things.

Can you tell me about how you use ICT in your teaching? Does it help/not help?

A few years ago, my clothes was messy with chalk dust and I believed at that time that I had delivered the knowledge in a perfect way. But now everything is changed and I start noticing that with showing videos or pictures it makes learning and pupils more effective and breaks the routine of the lesson. The new generation of the learners cannot concentrate more than 20 minutes without you getting their attention. Therefore, using technology is one of the technique that I used to get learners attentions.

Tell me about your use of Classera? what is help/not help?

I used to upload videos, handouts and homework through Classera for my learners but when there are school events most of the lessons are cancelled and we have no chance to catch up lesson time. Now with Classera we replace the lessons with a virtual classes and cover what has been missed.

Are there any things you do not like in Classera?

I am really struggling with the numbers in Classera as assessment is in English and I am teaching math in Arabic so when learners answered short exam or assignment questions they used Arabic numbers where the automatic correction find different answer which are the same but in different language then it shows me the learner got zero in this part. I

suppose if they could provide the numbers of two languages so the teachers and the learners have the choice.

Tell me about your learners' use of Classera? What they like and do not like?

I found my learners become more interested in doing their homework through Classera and they liked the way of receiving automatic feedback that help them to find out in which area do they need to focus more.

Table 47 an example of how this interview was coded

Teacher	Themes	Codes	Subthemes
B2	Teacher general use of ICT	Twitter and Facebook	Social media
B2	Teacher use of ICT in their teaching	showing videos or pictures	Displaying
B 2	Does the use of ICT help or not?	showing videos or pictures to makes learning more effective	Motivating learners
B2	Tell me about your use of Classera? what helps/does not help?	Uploading homework, handouts, videos and using virtual classes to save time	Classera functions; what is valuable about using Classera
B2	What is not help in using Classera	Arabic Fonts	Difficulties teachers experienced while using Classera
B2	Student use of Classera	Homework and automatic feedback	What learners like