INTRODUCING TABLETS IN A PORTUGESE SCHOOL: A MICOOL PROJECT CASE STUDY ANALYSIS

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ABSTRACT

The increasing popularity of tablets in society generally has sparked much interest in their educational potential and while a number of studies on the use of tablets in schools have been conducted world-wide most of these have been conducted in English-speaking and well-resourced education jurisdictions such as the UK, Australia, New Zealand and the USA. Studies conducted on the use of tablets in non-English speaking and educationally under-resourced countries are less wide-spread. This research conducted as part of an EU Erasmus+ Project (Micool), focusses on the introduction of iPads in a remote, rural region of Portugal where persistent under investment in education, particularly educational IT, has been acutely felt for almost a decade. Using a case study methodology this study reveals how many of the benefits associated with using mobile technologies in other educational jurisdictions were also replicated here, and how innovative teachers, despite working within a very traditional and rigid system, used the devices to suit their specific curriculum and classroom needs. Furthermore, this study will also reveal how international events such as the financial and economic collapse of 2008/2009 negatively impacted national education policies in a European country, the effects of which were acutely manifested in this school, particularly when it came to IT provision and support.

KEYWORDS

iPads, Mobile, Erasmus+, Intercultural, Tablets, ICT

1. INTRODUCTION

An increasing number of European countries have identified mobile computing devices, particularly Tablets as a focal point of their national strategies for education (Horizon Report, 2014). These multifunctional "always connected devices" allow simple tools and applications to be easily integrated into classroom activities with no need for involvement of IT support (Horizon Report, 2011). The increasing popularity of tablets in society generally has sparked much interest in their educational potential and research work has illustrated numerous benefits including their potential to enhance learning (Burden et al., 2012); their contribution to the development of teamwork and self-directed learning (Ciampa 2014); their motivational attributes (Clarke and Svanes 2012); their use as an assessment tool (Clarke and Luckin, 2013); and their role in advancing C21st teaching and learning (Melhuish and Falloon, 2010). While such studies documenting tablet use have been conducted world-wide most of these have been conducted in English-speaking and well-resourced education jurisdictions such as the UK, Australia, New Zealand and the USA. Studies conducted on the use of tablets in non-English speaking and educationally under-resourced countries are less wide-spread. This research conducted as part of an EU Erasmus+ Project, known as Micool (www.micool.ie), attempts to redress this imbalance by focusing on the introduction of tablets (iPads) in a school located in a remote, rural region of Portugal where persistent under investment in education, particularly educational IT, has been acutely felt for almost a decade. Research evidence emerging from this study adds to the growing body of evidence that tablets when used effectively can enhance teaching and learning in different cultural contexts which will be of interest to policy-makers who may question the universality of their appeal. Furthermore, by using a case study methodology and "thick description" (Denzin, 1989), to document the research findings, this study will illustrate how in the hands of conscientious and innovative teachers, tablets are adaptive devices which can be shaped to fit local and national educational contexts. Finally this study will also reveal how international events such as the financial and economic collapse of 2008/2009 negatively impacted national education policies in a European country, the effects of which were acutely manifested in this school, particularly when it came to IT provision and support

2. BACKGROUND AND CONTEXT

"Santo Redentor" (Portugese for "Holy Redeemer") is a public school located in a remote rural area in central Portugal. The school attracts students from villages and rural communities located within a 30 km radius. There is not much industry in the area and therefore the majority of students come from families that are not well off, but who nonetheless place a high value on education because of the possibilities it affords their children to make a better life for themselves. The region was particularly affected by the era of austerity as a result of the worldwide financial and economic collapse in 2008/2009, with many families forced to emigrate either abroad or to the main urban centres to seek out a living. The effects of this can be clearly seen in Santo Redentor's school numbers which over the last eight years have dropped by almost 35% from over 1,000 students to approximately 650 students today.

Santo Redentor is a partner in the Micool (Mobile Intercultural Cooperative Learning) Erasmus+ Tablet Project. Involving 6 European countries this two year project (2015-2017) is designed to promote the uptake and use of mobile technology in schools. In the latter part of the first year of the project Santo Redentor gathered sufficient funds to purchase 22 second-hand iPads. While the school caters for students from kindergarten to upper secondary (ages 3-18), with a unit also dedicated to students with special needs, the devices were used mainly, although not exclusively, in the secondary school. In March 2015, effectively 15 months after the school had acquired its iPads Santo Redentor's secondary school teachers and students participated in a research case study designed to document its experiences with using tablets and the benefits and challenges it encountered along the way.

A case study methodology was chosen because of the opportunity it provides to explore a single entity or phenomenon known as "the case" (Yin, 1994; Merriam, 1988) bounded by time and activity (a program event, process, institution or social group) through in-depth detailed data collection methods utilising "thick description" (Denzin, 1989). By its very nature thick description illuminates the context under study and allows the reader to enter into the environment and life of a culture as portrayed in the thoughts of the people who live there. The main data gathering tool in this study was a series of individual qualitative interviews conducted with a total of seven teachers including the school principal (n=7). In addition six focus group interviews with students comprising three participants per group (n=18), all aged 16-18 years, were also completed. Both teacher and student interviews were conducted using a structured interview format divided into key sections encompassing "Pedagogical Benefits", "Lesson Planning", "Interactivity and Group Work", "Participants' Perspectives on Tablet Devices compared to other School Technologies" and "How and in what way Tablets were affecting Change?" To protect the anonymity of the participants a pseudo name for the school (Santo Redentor) will be used in this paper and teachers will be referred to as "Teacher A, B, C," etc. Student Focus Groups have been labelled "Focus Groups 1 to 6". In accordance with rigorous qualitative research protocols, all interviews were audio recorded, fully transcribed and thematically analysed using the structured categories listed above to group the study's key findings together. In order to ensure rigour and validity to this process the thematic analysis was guided by Matthew, Huberman and Miles (1994) structured approach to qualitative analysis who defined this process as consisting of three concurrent flows of activity – namely, data reduction, data displays and conclusion drawing/verification. Based on following this protocol a number of key thematic findings emerged, the most important of which will now detailed in the following sections.

3. KEY FINDING I: ASSESSMENT, DIFFERENTIATION AND SECOND LANGUAGE LEARNING

Research interviews highlighted the predominant role that assessment plays in the Portuguese education system. The importance of testing and preparation for exams featured strongly with both teachers and students indicating that students were being constantly tested on a weekly basis in practically every subject to test out their content knowledge and preparedness for state examinations. Therefore much of the dialogue and discussion about the benefits of tablets in learning was framed in terms of their usefulness for testing and examination preparation purposes. Given this scenario it is hardly surprising that apps linked to assessment and feedback such as 'Kahoot' (Kahoot.com), 'Socrative' (Socrative.com) and 'Padlet'(Padlet.com) were identified as the apps most widely in all classes with iPads. These apps were liked by both teachers and

students as they helped to ease the intensity of lessons, and made for livelier and more energetic classrooms by breaking up the monotony of the "teach-content-test" approach. They also introduced an element of fun into classrooms which made learning much more dynamic. This in turn led to greater motivation and interest in learning as these observations indicate:

"The benefits are more motivation and interest. When using iPads they are interested in what they are doing. And because they are having fun at the same time school is not as boring as they all think…you know being in class and having to listen to the teacher again and again. So they are more motivated and I think that makes it more effective."

Teacher C

"They create a different dynamic in the class…. We can chat and we can talk with other when using the iPads so we can joke and have fun while learning in class which makes us more relaxed and more concerned about what we are going… We learn faster that way while having fun."

Focus Group 6

The dynamism and fun elements that the iPads introduced into learning appeared to be related to the opportunities they opened up for group work. This was particularly the case when it came to using the tablets for researching and completing projects. With iPads available to them in classrooms teachers were more inclined to encourage students to work in groups to either conduct research or work on projects. This was seen as expanding their horizons and helping them to move beyond a reliance on textbook and teacher knowledge, thereby encouraging them to become more independent learners:

"I think when you have the iPads that instead of the teacher having to explain everything you can say "look you're going to do research on this now" and I find this fosters groups work and opens up possibilities for them to work together rather than individually. And it's good because it moves them beyond the textbook as textbooks are very superficial compared to the research they can do with Google."

Teacher F

"I think it brings a new dynamic to the classroom. It totally does. You're not only focussed on the board and what the teacher is saying, You have a whole new experience and knowing you're working with the iPads, you're expanding your horizons, searching for new things and enlarging your knowledge. I believe it's very good."

Focus Group 2

As students became more accustomed to using tablets to support classroom learning activities teachers also noted how they became less reliant on them and were becoming more independent learners. This was viewed very positively especially for those students aspiring to go to university. Another added benefit of this development is that it allowed teachers to devote more time in class to less academically able students, hence facilitating differentiation. One teacher noted how the iPad suited kinaesthetic learners in particular while another teacher commented on how the iPads had helped her to *use "more diversified methods so that the work the students do is now more independent and not so teacher-based".* She went on to explain how the iPad facilitated both the academically advanced student and the academically challenged students simultaneously. Using second language learning as an example, she explained how she could now support struggling students to complete tasks, while setting additional tasks for more able students:

"Imagine we're doing an exercise on Padlet like I was using in class today where students were required to write and upload pictures about a daily routine. Some students struggle with this and needed my help while the brighter students finished it quickly. So I could just say to them 'Okay now you can practice your English using Duolingo" and as they all have an account they just switch over to it. So that kept them busy while the others were still concluding. That without the iPads would have been impossible. These good students would have stayed there looking at the ceiling or talking to each other and disturbing the class."

Teacher A

Given the importance of second language learning, particularly English in the Portugese Education system, it is hardly surprising that both teachers and students reported that iPads were used quite extensively in this field. "Phraesal Verb Machine" (https://itunes.apple.com/us/app/phrasal-verbs-machine/id593374912?mt=8) which was used for learning grammar rules and syntax was one of the most popular apps in this domain with some students also reporting the occasional use of "Duolingo" (https://www.duolingo.com/). Unusually students did not report ever using the iPads in-built recording facilities to practice and listen back to their pronunciation. Nor did they ever try to use this facility on their own smartphones while at home to help reinforce their spoken English or German language learning.

However one teacher observed that as she became more experienced with tablets she began to move away from using these specific language learning apps as she felt they were overly drill and practice focussed with too much emphasis on individualistic learning. To counteract this she moved towards using more collaborative learning apps like 'Padlet' where students could work in groups and cooperate while learning vocabulary and completing assessments. This was a welcome development as her students observed:

"I really like the Padlet because we can search, we can write down our ideas and then share it with the rest of the class instead of just doing those games like phrasal verb which is a really simple game. So I think the Padlet is the one that we've been using a lot recently, and that's the one we like the most."

Focus Group 4

4. KEY FINDING 2: THE IPAD AS A PREFERRED PEDAGOGIC TECHNOLOGY TOOL

The research interviews revealed that compared to previous school based technologies, most teachers believed the iPad was a more intuitive tool and therefore easier to use. Much of this can be attributed to the affordances of the device itself as features such as size, mobility, quick start-up time, the availability of learning apps and instant internet access contributed to its appeal as a classroom teaching and learning tool. Teachers also reported that they had hardly used the schools dedicated computer rooms at all since the iPads arrived, although it should be noted that they also reported that they had used the computer room infrequently anyway prior to acquiring tablets. This was due to the fact as one teacher said that the *"computers are old, very slow and some of them don't even work".* But even if this was not the case most teachers indicated a preference for investing in more iPads for the school rather than computers. As one teacher observed:

"This year I haven't gone to the computer room yet and we are now in March. I prefer iPads because I can use them in my room without having to go to a specific computer room. My lessons now are more interactive because in the classroom I can talk and see what they are doing while in the computer room I tend to sit at my desk looking at what they are doing but not interacting with them. With the tablets it's different because you are walking and talking and interacting more."

Teacher C

Although existing computers were deemed to be old and slow there was a general consensus that as a school they were quite lucky as a member of the administrative staff had an interest in technology and acted as an ad-hoc, on-site expert in maintaining the computers and school network. Alongside the IT teacher he helped to keep the school computers, which consisted of a computer (or laptop) and data projector in every class, the two main computer labs (rooms) and school library computers, operational. However if the school had not had this expertise on site their school computers would have ceased to function a long time ago. Due to the cutbacks experienced during the austerity era the school had been unable to update any of its computers which were now more than 10 years old and the only infrastructural investment it had made in that period was in its Wi-Fi system which was quite good. However many teachers expressed disappointment about the lack of support at government level for school technology when it came to upgrading machines or providing funding for a dedicated technical support person in schools. This lack of support from the Ministry for Education was best encapsulated by one teacher who queried why, if the Ministry could support all other

areas of school life such as canteen staff, security staff, cleaners and office staff, why not School IT? *"How is it possible", this teacher said, "to keep an IT system working with nobody employed to keep it going? I think it's not possible."*

It is probably due to the investment that Santo Redentor had made in its Wi-Fi and broadband infrastructure that teachers reported experiencing few, if any, technical difficulties with the iPads. The only issue raised related to battery issues if the devices had not been put back on charge once a class had finished using them. The bulk of technical and administrative tasks associated with iPads such as purchasing apps, updating and storage management were performed by the two teachers who represented the school on the Micool Project. They also ran the booking and timetabling system whereby teachers could book the iPads online via the school Moodle VLE platform each week for class use and this system was reported to be working well.

When the school initially became involved in the Micool Project the Principal and the project's teacher representatives hosted an information session for staff to demonstrate the iPads capabilities. All teachers were encouraged to take the tablets home with them for a number of weeks over school holiday periods to work with them in their own time and space, with the two Micool teachers making themselves available for informal training and support for anyone who requested it. It was very much a softly, softly approach and willingness to become involved was very much on a voluntary basis. There was a general consensus that this was the best approach as teachers did not feel under pressure and could come on board and try out the technology and explore its capabilities in a more relaxed way. By the time this research was conducted the school had been using the tablets for a full 12 months stretching over two academic years, and seven out of 35 secondary teachers could be classified as regular iPad users with a number of other teachers using them on an occasional basis. Plans were also underway to deliver significant training to all remaining members of staff on a whole school basis before the end of June 2017 with a view to increasing the number of regular iPad users in the following academic year.

5. KEY FINDING 3: THE CHALLENGE OF CHANGE

One of the main motivating factor behind Santo Redentor's involvement in the Micool project was a recognition of the importance of digital technology in the lives of young people and that schools needed to change to reflect this. Reflecting on the school's desire to be involved the school Principal spoke about how new technology was changing teachers' roles and students' expectations. With so much information now available on the internet, teachers were no longer the main source of information for students. In this respect one teacher noted how she had started to use resources from American websites because she found that most of her students had already visited many of the Portugese websites *"and already know the answers to the questions I use in class because they have already seen it online".* The challenge this posed was perhaps best summed up by another teacher who noted how the traditional classroom approach no longer engaged students as in the past:

Yes we do need to change. I feel that we are losing students and that is why we always have to try to find new things. We cannot get their attention anymore like we did in the past. In the past maybe we didn't get their attention, but at least they were quiet. Now they're not. And a student that doesn't listen and does not do things is a student that doesn't learn…… This is precisely why we need to change. We have to get their attention Because if they are not interested in what they are doing, they don't work."

Teacher A

According to the school principal the solution to this problem required a change in how schools and teachers think and operate – meaning that schools could no longer simply deliver information to students but instead had to become more involved in assisting students to become independent learners; this meant equipping them with the necessary learning skills to access the vast reservoir of information on the web and judiciously using it. Inevitably this would require a change in how teachers planned their lessons and thought about their approach to teaching. On a positive note the teachers who were regularly using iPads to support

their teaching reported that using the tablets had impacted how they planned for and thought about teaching their respective subjects:

"Yes having the IPad does change how I think about teaching my subject because now instead of just delivering content, I can challenge my students to go looking for the content themselves and then we can come back later and discuss it together."

Teacher E

"Actually it has diversified methods… I think the work they do now is more how can I put it…independent. Not individual. But they work more on their own and it's not so teacher-based. Do you understand?"

Teacher D

While these observations and reflections indicate some important underlying shifts in teacher thinking and methodologies among some teachers, it cannot be claimed that this is a widespread development. In fact both students and teachers pointed to some very powerful cultural norms and practices inhibiting many teachers from embracing changes that new technologies like tablets can bring. Students for example expressed the view that they would like to see more of their teachers using mobile devices but felt that some teachers had very traditional views about teaching and learning and that this acted as an impediment to greater usage. This was further compounded by the fact that they lacked the necessary skills to feel competent using such devices:

'I think some teachers are not ready. They don't know how..I mean they aren't used to computers, they are more used to text and so they are old school and more traditional… It's the way they learned and they want to teach like that, more or less."

Focus Group 6

"It's seen as a toy and they don't know how to manage it. It's hard for them because they learned in a traditional way and they don't have much knowledge about technology and they prefer the board and the books. They don't know how to teach with technology. So they are sort of old fashioned. They need to feel the paper and the amount of things you have to study."

Focus Group 2

When asked if they had ever tried encouraging these reluctant teachers to use the iPads by offering their expert knowledge in the technology to help these teachers out, the students firmly answered that this is not something they had ever considered. Long held traditional views about what constitutes teaching and the fear of students knowing more about technology was also cited by teachers themselves as a reason why some of their colleagues were not yet using the iPads:

"Students helping teachers? We never thought about that. I think the reason some teachers avoid using tablets is because they don't want to show that their abilities with technologies are so low. There's the problem."

Teacher D

Peer observations of teachers using iPads in class as a way of helping reluctant users to become more familiar with the devices did not appear to be an option because as one teacher explained *"that's a big difficult issues because most teachers don't want anybody else inside their classrooms. They are very strongly against that."*

Aside from long held cultural beliefs about teaching norms and practices other systemic and structural issues also affected the extent to which tablets were utilised by teachers. The research interviews with

teachers revealed how the exam driven nature of the Portugese system meant that teachers felt under constant pressure to assess and test out students' knowledge and abilities. Although teachers wanted to use new technologies and devices like iPads to make learning more enjoyable and interactive, the traditional examination system that was paper based and knowledge driven, meant that they had to prepare students in traditional ways to be ready for such exams. Parental pressure was also a factor, as in the end of the day teachers were judged by how well their students passed their school exams in order to secure university places:

"In Portugal we have a huge problem I think because we are a very exam based system. Very often I could do more things but I need more time but I have to deal with all the topics on my curriculum because if I don't and if something comes up on the exams that I haven't covered I will have parents on my back saying "you didn't cover this, they didn't practice any of this ." Then I cannot tell them, "oh I was trying out new methods with the iPads". This doesn't work. It's a huge problem and you need your grades to get to university because otherwise you won't get a nice place to study".

Teacher A

Finally the economic crisis of 2008 followed by years of austerity also influenced the extent to which some teachers engaged with the iPads. Stringent cuts in teachers' salaries alongside an increase in teaching contact hours from 22 hours pre-austerity to 27 hours post austerity, less annual leave, plus a cessation in incentives for career progression whereby teachers who undertook professional development courses in areas such as new technology etc. could be promoted to more senior levels, had demotivated teachers. Consequently many were now more reluctant to welcome and embrace new developments and invest time in trying out new opportunities such as using tablets in teaching. Furthermore, because school numbers had fallen by 35% since the recession, the school had not been able to recruit new teachers over that ten year period. Consequently a state of stasis had set in with most teachers now in the 40-60 age group, with a significant number approaching retirement. This made change and the introduction of new teaching methods and new technologies difficult to implement.

6. CONCLUSION

This case study has documented and discussed the introduction of iPads in a remote, under-resourced school in rural Portugal. Despite a different cultural and linguistic context many of the benefits and attributes associated with using mobile technologies in education found in other educational jurisdictions were also replicated here, thereby suggesting that the pedagogic value of tablets has a certain universal quality once properly deployed. Part of this appeal may be related to the tablets' versatility and malleability because, as this research has illustrated, even teachers working in a very traditional and assessment focused education system, found ways of using the device to suit their classroom needs; thereby adding some much-needed dynamism and enjoyment to a very rigid and didactic curriculum. The obvious limitation of this research is that as a single case study underpinned by a qualitative research methodology it lacks the statistical generalizability of quantitative research. Nonetheless, in the tradition of rigorous case study research, it sheds a light on some important contextual issues about how innovative projects are adopted and assimilated into organisations, including some of the challenges encountered along the way such as how global events like the Austerity Crisis had local ramifications in terms of ICT progress and widespread tablet adoption in Santo Redentor.

ACKNOWLEDGEMENT

This research was made possible by funding received for the Micool Project (www.micool.org) under the EU Eramus+ Programme. Project number: 2015-1-IE01-KA201-008669.

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