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**Challenges to implementing a new
technology in Teacher Education. Phase
One: 'meaningful' digital reflections**

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Abstract

This paper describes the challenges of introducing a digital tool to trainee teachers. A group of nineteen undergraduate students studying primary education and in their third year of a four year course was introduced to PebblePad5. PebblePad is an online tool which is not new in the world of ITE. However, the latest version has more useful features and is less 'clunky' than older versions. The students each had their own private account where eventually they would be expected to store all of their placement files, add multi-modal content and then choose to share some or all of this content publically or by personal invitation via email. One of the benefits for us as an ITE provider is that we can view our students' files electronically and comment on them without necessarily making the one/two hour round trip to the placement school. Although students used some technology, this research shows that students need more training in using technology competently in the workplace setting. Phase One of the project was to encourage the students to write their reflections on placement digitally. It was hoped that the students would be enthusiastic about using PebblePad and I would see an improvement in the levels of engagement with the reflective process and thus, the quality of teaching and learning as a result of this. Data obtained from questionnaires and a focus group indicate that PebblePad was viewed as a useful tool, but training issues and time constraints of the project meant it was not as successful for this cohort as was hoped. This paper discusses the issues that arose and the plan to overcome these barriers in the next phase of the implementation of PebblePad.

Keywords

Reflection; digital; teaching and learning; digital literacy; teacher education; pilot.

Introduction and Background to the Project

This paper reports on the evaluation of a project where B.Ed. student teachers were asked to pilot a digital tool to record their reflections whilst on their teaching placement. The guiding aims of the project were to help our students to see the value of reflecting and also to give them the opportunity to engage with a tool which will be beneficial to them post qualifying. It has been argued that trainee teachers and teachers are not always digitally competent and that this then hinders the effective use of technology in the classroom, (Montgomerie and Irvine 2001; Wilhelmsen et al., 2009; Tømte, Kårstein, & Olsen, 2013; Beadle, 2016; Lohnes Wataluk, 2016). This in turn, does not allow the pupils to always see technology being modelled effectively. I was keen for the students to become competent in using a tool which they would continue to use once qualifying (Lohnes Wataluk, 2016). We are moving rapidly to a situation where all pupils will have access to a mobile device (Remis, 2016), and being competent in using technology to support teaching and learning is required of teachers. The vision was that ultimately all planning, assessments, photos and videos of the children, policies, inspiration from other sources, their personal development portfolio (PDP) and so on, would be stored in the one place and would be accessible from anywhere at any time, and parts, or all, of this could be shared electronically if so desired.

Citation

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Reflective practice has become synonymous with ITE. On our B.Ed. course there are currently three or four taught modules that have within them the title 'Reflective Practice'. These modules are based around the school placement practice for the year. Within the modules, there is an expectation that the students will form an understanding of reflective models of practice and will engage in reflection, both of a personal nature and from a teaching and learning perspective. In the first two years the students are asked to complete a Record of Reflective Practice (RRP). The RRP is in paper format separated into each T-Standard (Teaching Standards for England, DfE (2011)). Students are expected to write reflections pertaining to each T-Standard.

Only 19 students were in the third year of the four year course, the other 75 were completing in three years. As this was a small cohort and I knew them well most students felt comfortable expressing their views on completing the RRP. It was felt to be 'tedious'; 'time consuming'; a 'waste of time'; 'just a box to tick'; 'a burden'; and something the students only 'do because we have to'.

Looking at the quality of reflective comments made and having discussions with the students it was clear that most reflective comments were made retrospectively and it was actually merely a tick box exercise. It seemed that as Gore & Zeichner (1991) wrote regarding their analysis of some models of reflective practice:

In some extreme cases, the impression is given that as long as teachers reflect about something, in some manner, whatever they decide to do is acceptable, since they have reflected about it, (Gore & Zeichner, 1991:120).

It was decided that this small cohort would trial an online tool. By allowing the students more flexibility and choice over what to reflect upon and how to reflect I speculated that the students would have a sense of ownership and the digital tool would seem more accessible and attractive to them. The University had just bought 30 licences for PebblePad5 and so each student was given an account. The students did not have to use these accounts for their reflections - if they had a different digital tool that they were familiar with they were encouraged to use that, similarly, they could continue to use the traditional paper format (RRP).

Phase one of this project, then, was to familiarise the students with the tool by asking them to write their reflections regarding their teaching practice online. Within Education, there are different understandings of reflective practice, but a common agreement is one stated by Finlay, that reflective practice is the 'process of learning through and from experience towards greater insights of self or practice' (Finlay, 2008:1). In this title I have used the term 'meaningful' to signify that the reflections have relevance to the student: all too often I felt that students were paying lip service to the process of reflection. It was hoped that through the introduction of a digital tool where the students would construct the content multi-modally and in a format that had personal meaning and significance, the quality and relevance of the reflections would improve. The use of this tool follows the constructivist notion that teaching and learning are active processes. I follow the philosophy that the process of reflection is as important as the end product. The idea was that the students would link their reflections to work elsewhere, for example theory, models of learning, inspirational pictures, displays and TEDx talk, to name but a few, which some of them did.

Literature Review

There are two elements to this review: the first concerns itself with reflection; the other with digital competencies and use of technology in the primary classroom by the teacher. I was aiming to improve the students' capabilities in both of these areas.

Ottenson (2007) discusses the problem I encountered, whereby students feel they think all the time and become frustrated with this externally imposed reflective structure that is demanded of them. As Larrivee states, 'The process of becoming a reflective practitioner cannot be prescribed', (Larrivee, 2000:296). Tarrant (2013) argues that if being reflective is externally imposed on someone then it will not be effective. The person doing the reflection should have ownership of this process; they should see the value in doing it, for as Bolton (2010:8) points out: the difference between being reflective or not, is having '20 years' of experience, or one year of experience repeated 20 times.' It is a lifelong endeavour to challenge one's own practices and beliefs and to strive to change and be adaptable and open minded. However, the notion of critical reflection is not always clear to students, (James 2007; Finley, 2008; Moon, 2009) and this is something that needs to be modelled. Moon (2004) suggests that the representation of learning is a further source of learning material. As the learner captures and records her thoughts, the learner re-organises her thoughts and the presentation of ideas; 'she is sorting out her understanding of those ideas and is learning more since the organisation and clarification of ideas are a process of learning' (Moon,2004:14). These re-presentations of learning represent a process of reflection within a chosen medium, rather than a 'direct mirror of what happens in the head' (Moon 2004, 80). This results in secondary learning or a deeper level of learning.

I proposed that the students should ask their mentors to film them and then to reflect on this together. Seeing oneself on film can be a very daunting and intimidating process, but as McCullagh, Bell & Corcadden (2013) state, the benefits, if done well, can be immense. McCullagh et al. (2013) reported that the students they trialled this with were able to view themselves in a way they had not before. More importantly, perhaps, they were able to see pupils' reactions to their teaching. Doing this in the moment of teaching is a difficult skill for even the most experienced teachers, but for student teachers who have so many other things to think about, not least, where they are in the lesson plan, it is almost impossible. This is why Wildman & Niles (1987), Hatton & Smith (1995), Berliner (2001) and Tarrant (2013) argue that reflection-in-action (Schon, 1983) is too difficult for the student teacher. A further use of videoing used by McCullagh et al. (2013) was for mentors to also be filmed. The mentor would then sit with the student and model the reflections s/he had. This allowed the students to see that experienced teachers did indeed reflect. Our students reported that their mentors '*did not have to write down their reflections*'. The assumption therefore being, '*why should we?*' Alger (2006) and Hoath (2012) question whether teachers do engage in reflective practice. Wildman and Niles (1987) suggest that teachers do not have the time to reflect in an objective way. The luxury of time to be able to stand away from their practice and analyse what they are doing and why and to search for better solutions is not something the average primary school teacher has (Van Manen, 1991).

Reflecting as part of a university course, however, is not without its challenges: the student knows what s/he should say to 'pass'. This is not the same necessarily as being very open and honest with one's own thoughts. There is also an imbalance of power between the student and the mentor or ITE tutor, (Hatton & Smith, 1995; Moon, 1999). There is a balance to be reached between being open, honest and flexible and doing this in a standardised way for public scrutiny.

Reflective practice is traditionally viewed as being something that happens in conversation with a peer, mentor or colleague, or in a private space when the practitioner puts pen to paper, (Powell, 2011) but this does not have to be the case. I wanted to discover if reflecting digitally and incorporating multi-media would lead students living in this digital age to have a sense of ownership over their reflections. Blau, Peled & Nasan (2014) discussed the phrases we have come to accept as reality, such as: 'digital natives'; 'the millennials' or 'google generation' – labels I was unconsciously applying to the students. They dispute these terms however and accept instead a far more appropriate term suggested later by Prensky (2007) of 'digital wisdom' - using technology wisely. This has less to do with the era in which someone is born and more to do with appropriately and competently using technology. I was aware our students were all competent in some areas of digital

communication – namely social media - but I was keen to begin to develop their professional use and competency of digital technologies. However, as Laurillard (2007) stated caution must be had in that we do not simply recreate what we do digitally in the same way as we do on paper. There is a capacity to transform practices (Laurillard, 2007) not merely to recreate them. Blau, Peled & Nasan (2014) found this to be the case when introducing technology to experienced teachers – new technology may not 'fit' existing pedagogical practices. Pedagogy may need to change and adapt to match appropriately and wisely. They found that this was a major reason more experienced teachers struggled more to adopt new technologies.

Kellsey & Taylor (2017) ask educators to re-evaluate the role of the teacher in the digital age where learners are all connected. With reference to Susskind & Susskind (2015) they discuss the term 'post-professional age' and quote statistics that 'more people signed up for Harvard's MOOCs (Massive Open Online courses) in a single year than have attended the University in its 377 years' existence' (Susskind & Susskind, 2015 58, cited in Kellsey & Taylor, 2017). There is ambiguity about what the future will look for the next generation of pupils; about what we are educating them for (Susskind & Susskind, 2015), however, one thing is certain: our student teachers need to be digitally competent. I am aware, however, that this presents challenges, not least in terms of ITE staff having the skills, knowledge and pedagogical knowledge to be able to support our students (Koehler & Mishra, 2009; Puttick, Drayton & Karp, 2015).

Methodology

Research questions and design

The research questions were:

- Would students have a more positive disposition towards reflection (Bolton 2010) if they could choose an online digital tool?
- Would the use of this tool then continue to be used by the student to support their teaching practice?

This action research project started in October when the students first expressed their thoughts on the RRP and ran until the end of their placement period in May when I asked the students to complete a questionnaire and discuss the use of PebblePad. Crimmins (2016) writes about how, for her, her research choice was related to her personal experience:

We engage with our environment on both an affective/ emotional and intellectual level and our thoughts and feelings stimulate our action in the world (Crimmins, 2016:485).

This project similarly arose out of a personal observation and students' reactions. Noting students' frustration with the course requirements (i.e. reflection), I wanted to introduce a digital tool as I thought it would change how the students engaged with the process of reflection. The epistemological assumptions underpinning this project include the following:

- The object of the enquiry is the 'I';
- Knowledge is uncertain;
- Knowledge creation is a collaborative process

(McNiff & Whitehead, 2006:26).

Action research is about looking for personal solutions that are pertinent to the particular case. In my project I was looking for ways to engage students better in the process of reflection and to equip them better to work digitally. There are no claims that knowledge is true and that there is only one answer, but more that there is a realisation that there are multiple answers and interpretations. Action

research is a matter of inventiveness of trying things out and of one cycle of action-reflection leading onto another: a recognition that learning is never complete (McNiff & Whitehead, 2006). For this project, there were many possible solutions of improving the attitude to and therefore the quality of reflections; there were different digital tools and we could have also looked at changing expectations of the course requirements. The project was only one possible option and was trialled on a small group of students to examine the efficacy of the project, before rolling it out to larger cohorts.

I was the principle lecturer teaching on the placement module and knew the students well. This could be perceived as a dangerous position which could affect the outcomes of the research because of my 'insider' status. Practitioner based research is often criticised for the notion of being 'too close' to the research participants and therefore not critically distant enough from the research (Hammersley, 2000). However, from an interpretivist perspective – which is my own stance - research will always be viewed as partisan – it is impossible to capture everyone's viewpoints and perspectives, (Smith,2008). The insider status was also important as it allowed for me to gain access and trust from the students and they knew I had some potential for affecting change. I foster an environment where being open and critical is valued and not seen as a threat. The students were treated as adults who had valid and interesting points to make. As a result, they were very open about their thoughts on the imposed system of reflection and how they had treated it for the previous two assessed placements. It should be noted, that I empathised with the students as I would have struggled to complete the paperwork as it stood, too. There could have been possible bias in the initial comments about the RRP from the more vocal members of the group (Cohen, 2000). However, questionnaires that were administered after the students had been on placement confirmed the opinions of the RRP were widespread.

In order to gain views from all the students after their placement a questionnaire with open and closed questions was given to all students in class time. Whilst I acknowledge what people may put down on paper can be different to their actions (Silverman, 2010), I did have access to the actual work the students produced which validated their comments. A focus group of 9 students was then undertaken by me with those students who volunteered to share their thoughts and feelings on the process. Both those with strong positive and strong negative feelings were sought out in an effort to minimise bias and for parity of viewpoints. These views were known as the students were feeding back during sessions and I had access to the student accounts and could see how the students had interacted with it. The data comprise the thoughts and perceptions of the student teachers. This project followed the ethical guidelines from BERA (2011), and ethical approval was given by the University. It must be stated here that the follow up questionnaires and focus group were sought in effort to inform me how the process had worked and how I needed to move the project forward in to phase two. I am making no claims on this being a major research study or that it is even generalisable (Cohen, 2000).

Findings

Data from the questionnaires are summarised below in Table 1.

Table 1. Students' views on completing the Record of Reflective Practice (RRP) and on PebblePad.

Enjoy completing RRP's?	5 Yes	14 No
Value putting reflections into text rather than simply discussing it/ thinking it?	14 Yes	5 No
Try using PebblePad5?	15 Yes	4 No
PebblePad5 useful?	11 Yes	4 No 4N/A

From this it is clear that 14 of the 19 students did not like completing the RRP, however, 14 students did see value in writing down their reflections. This is an interesting observation. It is clear that the importance of reflection is not lost on the students. It can be found within the Teachers' Standards in England:

T4: *To reflect systematically on the effectiveness of lessons and approaches to teaching.* (DfE 2011).

It could be argued that the students felt that was the 'correct' answer given that it was the lecturer who was asking the questions (McCambridge, Witton & Elbourne, 2014). However, earlier comments have made it clear that the students felt able to express themselves without fear of judgements. They were not inhibited when saying they did not like the system the University had set up, i.e. the RRP. Also however, it is clear that the RRP did work for some students, which is why I wanted there to be flexibility, exchanging one externally imposed system for another was not my aim.

Not all of the 19 students engaged with PebblePad, the 4 who chose not to said they preferred to continue to use what they already knew (RRP). This was due to time pressures on teaching placement – working out how to use the new tool was considered to be too much with the pressures of planning for placement. Of the 15 who did engage with PebblePad, 11 found it useful. Reasons for not liking/using PebblePad were accessibility in terms of internet access and ease due to unfamiliarity with the tool and a lack of time to practise and explore using the tool. Surprisingly for me, the issue of not being confident to use the tool featured quite often in the students' comments. It was a fact that due to a very tight timescale from receiving the licences and the students going off into placement, the students only had one training session at the University. Our learning enhancement team did, however, put more training videos on the University's digital platform. I had wrongly assumed that our students were 'digital natives' and part of the 'google generation' (Prensky, 2001).

Of course, it was not lost on me that I was substituting one tool for another and that it was the *process* of writing down reflections that the students had originally complained about.

The positive aspects of using a digital tool far outweighed the negative aspects, however. Table 2. displays the students' comments when discussing this.

Table 2. Students' views on PebblePad.

Positive	Negative
<p><i>'Easy to use.'</i> <i>'Multi media –options to do more than just write –less description necessary, focus on the analysis.'</i> <i>'Can do it on the bus on way home.'</i> <i>'Photos add to memory.'</i> <i>'Saves printing/paper costs.'</i> <i>'Can access from anywhere –don't have to carry paper around.'</i> <i>'Safe in one place –less likely to get damaged/ lost.'</i> <i>'Phone app useful.'</i> <i>'Can add bits in –stays neat –easy to keep as a working document.'</i> <i>'Reflections and evidence base together.'</i></p>	<p><i>'Training- not confident.'</i> <i>'Comfortable with format used for last 2 years.'</i> <i>'Not always able to access the internet.'</i> <i>'Safe guarding means can't take devices into the classroom.'</i></p>

The positive reasons for liking PebblePad can be similarly categorised into ease, flexibility, accessibility and multi-modal facility. The flexibility and the ability to structure reflections in a way that had more meaning for the students was recognised. Reflections did not have to be categorised into a neat box under one particular T-Standard. Using a multi-modal format allowed for students to focus more on an analysis rather than a description as photos and videos replaced the need for such descriptions. It was also reported to be neater and allowed for a better and more manageable way of storing information. Clearly for some students being able to write reflections that had significance to them but which did not have to be categorised into one particular T-Standard was helpful. Students reported having the flexibility to do this made the reflective process easier. Linking pictures and videos to aid discussions was also reported to help the writing process as less of 'stating the obvious' (writing the description) helped.

Discussion

This pilot study was successful in that it highlighted the potential benefits of using a digital tool, but it also drew my attention to many areas of weaknesses in the implementation of the project. I realise that making assumptions about students embracing technology and change is wrong. Our students need much longer to become familiar with and then competent with this tool, (Angeli & Valanides, 2009). More time spent training the students with PebblePad and introducing them to PebblePad before asking them to use it on placement away from University will greatly enhance the confidence of the students (Lohnes Wateluk, 2016). To this end, it has been agreed that the B.Ed. Year 2 students will be given a licence next academic year and they will begin to upload small amounts of work to their account. This will ensure that when they enter Year 3, PebblePad will be a familiar tool. School based mentors will be introduced to PebblePad at their training at University and short video analysis sessions will be built into the training to support mentors on placement engaging with this practice. The current Year 3 students will continue to use PebblePad in their fourth year. More training will be given to support those students who are not yet confident. ITE staff have also anecdotally expressed their concern about their lack of knowledge and confidence in using PebblePad (Koehler & Mishra, 2009; Puttick, Drayton & Karp, 2015) so I will be developing training for the staff too. Video analysis sessions with the students will take place at the University by simulating some teaching. The intention will be to break down the apprehensions of seeing oneself on film and to begin instead to see the benefits of engaging in this type of practice (McCullagh et al. 2013). These students will also be supported to use this evidence base to construct an e-portfolio which can be sent to prospective employers. They will also be able to move to a paperless teaching folder. Furthermore, they will benefit from best case exemplars from this year's pilot to build on. Pelliccione & Raison (2009) document the benefits of this for their students when implementing e-portfolios.

Modelling reflections will also be a feature of further training. More structure to the reflections will be developed for those who require it. It became apparent this year that some of our students needed this. Reflections separated into categories other than Teachers' Standards will be modelled based on Gore & Zeichner's (1991) 'varieties' of reflection: academic reflection; social efficacy reflection; developmental reflection and social re-constructivist- critical reflection (James, 2007; Finley, 2008; Moon, 2009). I have now made example blogs to show how reflection can look different.

Before implementing this project, the students felt they did not 'own' their reflections, but rather this was an obligatory part of the placement requirements. Student teachers had been asked to write on a standardised form in a way that held little meaning or relevance for some of them. I agreed with Tarrant's (2013) comments about the need to own the reflections and similarly, the need to own the digital platform and how to present the reflections. Post phase one, it is clear that some students do need the structure to support them. During phase two of this implementation there will be an optional structure for those who need it, ideally I will still be looking for students to take ownership of how they present and organise their work.

The first research question: 'would students have a more positive disposition towards reflection (Bolton, 2010) if they could choose an online digital tool?' cannot be fully answered because the online tool was not as accessible for all of them as I had assumed. However, for the majority who did use the tool, the students were adding photos and videos and one added a TEDx talk that had had an impact on them and how they now viewed their practice. None of the students this year videoed themselves or their mentor but some are discussing doing that on their next assessed placement.

The discussions about more 'meaningful reflections' are not in as greater depth as I would have hoped because as a result of this trial, I have discovered that introducing a new digital tool has been tricky for more students than I would have expected it to be. The systems the students have been used to for the previous two years gave the students a sense of comfort and to change that actually caused more stress for some than I had anticipated. There are bigger issues here to do with change and institutionalising student teachers, but there is no space to discuss these in this paper. However, it has meant a change in focus from looking at the quality of reflections to discussing the implementation of a new digital tool.

Beadle (2016) argued that the introduction of technology can increase the stress levels of teachers and it cannot be assumed that technology will be readily embraced. It is hoped that this tool will allow student teachers to become competent with a tool that will be versatile enough to be used within the workplace post qualifying. However, without proper time for training and opportunities to practise, some students did report that using a new tool added to their stress and workload. Issues of connection and accessibility to devices in the classroom also need consideration – again this will be addressed at mentor training. Some students simply recreated the paper version of the RRP digitally (Laurillard 2007), whilst this was not the intention it was still welcomed as a first step. Those students now have the confidence to 'play' with the technology and use the features to develop their representations.

Conclusions

In summary, the findings suggest that a digital tool can support a student teacher to make relevant reflections that have meaning and significance for the student and which support the student in their practice, but only with more support from us as lecturers and from the assistance of mentors (James 2007; Finley 2008; Moon, 2009). Some ITE staff will need guidance and support too and we will assess where we are as staff and how we need to develop (Koehler & Mishra 2009; Puttick, Drayton & Karp, 2015). Some students readily embraced the technology with little support and guidance and were competent in making it work for them. Reflections had meaning (Tarrant, 2013) and were not in a standardised format; links and videos were embedded in. These examples will be used to support students and staff in the next phase of this project. I intend to track the reflections of some of our students during the three years on their degree course with us to assess how these change over time. The aim is that all students will be using this tool or a similar one for all of their placement practice needs and relevant parts can be shared remotely. They will then use this tool to select relevant pages to create an e-portfolio that will be used when applying for jobs. Moreover, they will then have a tool that they can use post-qualifying, which will enable them to be more efficient.

Teachers not only need to model the effective use of technology for pupils (Beadle, 2016), they should also be using it to ease their workload. This discussion is rooted in functional digital literacy (Lohnas Watulak, 2016), our next challenge once our students are using this tool competently is to move towards a more critical digital awareness where we begin to situate an understanding of our use of technology in a broader context of choice and socio-positions.

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