

THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGY FOR ASSESSMENT IN PRE-SERVICE TEACHER PROGRAM: VIDEO AND E-PORTFOLIO

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Abstract: This paper addresses the challenges and opportunities while using digital artifacts like videos and e-portfolio as tools for assessment in pre-service teacher training programs. A case study was conducted at a hogeschool in Brussels. The aim was to explore how videos and e-portfolio are applied to assess student teachers' performance and how beneficial or challenging these tools are if applied in the teaching and learning process. Semi-structured interviews and qualitative method were used to collect and analyze the data. The findings showed that although there was strong integration of information and communication technology (ICT) in the curriculum, particularly for assessment, the implementation of these tools was still hindered by the limited vision and belief of the teacher trainers. Based on the theoretical issues and the context of the case, suggestions were made with the intention to improve the implementation of ICT tools for assessment in pre-service teacher education.

Keywords: Pre-service teacher evaluation, ICT, assessment, video, e-portfolio

1. Introduction

The emerging changes and trends in the field of education have witnessed an increase in the application of information technology in teaching. This has brought teachers certain benefits as it creates intriguing opportunities for new forms of learning. Research suggests that technology has immense potential for learning and that teachers can make their classroom practices systematic by pedagogically informed use of technology (Persico, Miligan, & Littlejohn, 2015). This implies that information and communication technology (ICT) has multiple uses in teacher training as it can provide more flexible and effective ways for teacher's professional development, and improve pre- and in-service teacher training, and connect teachers to the global teacher community, teacher training and networking (Jung, 2005).

One of the important uses of ICT is to assess learners' performance and along with the growth of virtual environment, the use of ICT to report the responses from students, or to convey feedback also grows (Gipps, 2005). However, digital assessment is still a concept in an on-going development and challenging in implementation (Chaib & Svensson, 2005; Toit, 2015). Among different applications of ICT for assessment, some studies have explored opportunities and challenges of videos and e-portfolio as the tools for assessment.

2. Literature review

2.1 Assessment in pre-service teacher education

The issues of school testing culture, examinations and assessment of coursework have been debated by academia and public for many decades. In recent years, however, the assessment has been subject to significant development, with considerable emphasis on the assessment for learning and student inclusion in the evaluative process (Black et al., 2003). The pioneering work of Black and Wiliam (1998) established that assessment is more than just means of acknowledging and measuring achievement but it must be used to guide the learning process and assist in higher levels of attainment. All different forms of assessment gather the relevant information about students' knowledge and learning. Harlen (2007a) explains, that the type of assessment itself is not the distinguishing characteristic but, the purpose of the evidence gathered from the assessment instead. Gardner and Rea-Dickens (2000) appear to agree with this view as they are convinced that the differences are based on the uses of the assessment findings and conclude that the same data may be reviewed for different purposes.

Nevertheless, in academic literature, the most commonly used theoretical constructs for evaluation are those of formative and summative assessment. One of the definitions on differences between formative and summative assessment has been suggested by Crook (2001). According to the author, *summative assessment is intended to summarize student attainment at a particular time, whereas formative assessment is intended to promote further improvement of student attainment*. Although the distinction appears straightforward, Taras (2005) insists that the line is not so clear and that formative assessment is in fact summative plus the feedback. Most of the academic literature categorizes any assessment used to assign grades as *summative*. Tests, final exams and work portfolios are most commonly recognized examples of summative evaluation. It commands the student's attention because the results typically appear on the report cards and transcripts. Too often summative assessment is focused mainly on knowledge reproduction and therefore emphasizes the rote learning. The higher forms of learning and the higher cognitive processes such as analysis and synthesis are not being evaluated during the summative assessment. Although the test may be designed for summative purposes, the resulting data can be interpreted either formatively or summatively. Wininger (2005) uses a summative examination as a formative assessment by providing both quantitative and qualitative feedback about the results. *Formative assessment* occurs mostly in the classroom during the learning process. This ongoing evaluation provides teachers and students with information about the process and progress of learning. Quizzes, questions, teacher observations, learning logs, student made concept maps and portfolios can be used in formal or informal manner. The results of the assessment are used only to improve student learning and don't factor into course's grades. The central part of formative assessment is the concept of *feedback*.

Hattie and Timperley (2007) conceptualize feedback as information provided to a student regarding aspects of his/her learning or understanding. The aim is to reduce the disparities (gaps) between current understanding or performance and the desired goal (Hattie & Timperley, 2007). Hattie and Timperley (2007) also report that students benefitted the most from receiving feedback about a task and how to complete it more effectively; the praise, rewards and punishment have been shown the least effect on learning development. That said, it is always important to consider the emotional aspect of feedback on the learner. Students' receptiveness or rejection of the

provided feedback depends on how they feel about themselves, their learning, the subject and the instructor (Dweck, 2007). The motivational dimension allows students to feel in control over their learning. The cognitive dimension provides students with necessary information about where they are in their learning and what to do next (Brookhart, 2008). Cassidy (2011) suggests the use of self- and peer-assessment in case of self-regulated learning, considering it a powerful tool in terms of developing metacognitive knowledge. Topping (as cited in Cowie & Harrison, 2016, p.342) reports, “peer assessment had shown positive influence on student motivation and learning engagement”. In supportive environment peers use each other as a resource for sharing and evaluating their ideas (Cowie & Harrison, 2016). Moreover, the familiarity with the context and commonality of used language in addition to social benefit of face-to-face interaction should provide learning advancement.

2.2 Assessment and ICT

As mentioned, with the rapid growth of information and communication technology, the assessment process now also involves more and more uses of different technologies. For example, Jung (2005) argued that information and communication technology (ICT) with its various options from videoconference to websites has helped both in the instruction delivery and the learning process, which allows teachers to meet modern education challenges. When analyzing ICT use in the field of teacher training, Jung also mentioned two schemes, which were training teachers *how* to use ICT and training teachers *via* ICT. Accordingly, he organized the ICT teacher training approaches into four different sections including (1) ICT as main content focus, (2) ICT as part of content or methods (training teachers *how* to use ICT), (3) ICT as core delivery technology and (4) ICT as facilitating or networking technology (training teachers *via* ICT).

The use of ICT for the assessment purpose falls into the category of ICT as part of content or methods. Back in 2003, ICT for assessment was predicted by Kirschner & Niki to be the future (of that time) pedagogic benchmark for ICT in teacher education. Accordingly, assessment via ICT with different forms such as e-portfolio or diaries, which can help engage students to collaborate in assessment, was anticipated to be more and more important. Nowadays, digital technology offers more chances to assess students’ performance in different manner than before (West, 2011). As explained by West, thanks to technology, teachers now no longer limit their assessment to only summative method with standardized tests, but they can give feedback at nearly every step of students learning process. This way of giving assessment is more formative and can provide teachers with additional information about where students are in the learning process and to guide them in achieving their own learning goals.

Cowie and Sakui (2015) separated two different trends that link assessment and technology, which are measuring outcome to support learning (or it can be understood as learning analytics); and assessing different learning outcomes (such as collaboration, or the link between digital technology and students’ learning activities, etc.). These authors also discussed that digital technology has helped in some traditional assessment methods via computer tests and quizzes automatic marking; or through many software tools for students’ self-assessment which provide automatic assessment and feedback. However, as also argued by Cowie and Sakui (2015), the recent innovation in technology has developed more assessment tools that teachers can apply in their teaching. They argued that various Web 2.0 tools can be employed to assess

individual skills and knowledge, and to provide the evidence for students learning part. For example, Web artifacts like videos, blog, or audio recording, etc. can be used to access skills and knowledge; and they all can be included in an e-portfolio to prove students' learning progress.

The scope of this paper will focus particularly on the use of videos and e-portfolio for the purpose of assessment in teacher education.

2.3 Videos and e-portfolio as a tool for assessment in pre-service teacher education

The use of videos and e-portfolio for pre-service teacher assessment has been emerging as a trend to be considered when planning for candidate assessment (Barrett, 2002; Lutovac, Kaasila & Juuso, 2015). By definition, video is regarded as a tool that allows student teachers to develop the ability to notice what is occurring in the classroom, facilitate reflection on teaching practice and make more specific observations focusing on pupils' learning (Coffey, 2014; Lutovac, Kaasila & Juuso, 2015). E-portfolio is a carefully selected collection of exemplary artifacts that allows demonstration of one's best work and accomplishments (Barrett, 2002; Wieseman, 2016). It provides a rich picture of performance, shift ownership and responsibility of learning to the learner, nourish inquiry, and permit assessment of process not just product of learning (Barrett, 2002; Wieseman, 2016).

There are various studies of the benefits of using videos and e-portfolio as a tool for assessment in pre- service teacher education. The first significant advantage of using video and e-portfolio is supporting self-assessment (Barrett, 2002; Lutovac, Kaasila & Juuso, 2015; Wieseman, 2016). It is obvious that pre-service teachers learn to teach based on analysis of lessons conducted by others and they develop an understanding of their own teaching and themselves as teachers (Lutovac, Kaasila & Juuso, 2015). During this process, videos and e-portfolio play an instrumental role in efforts to capture, assess the performance of student teachers (Barrett, 2002). First videos permit students teacher to collect, review and watch video to assess their growth as a professional and reflective practitioner (Barrett, 2002). Then, e-portfolio has strength in storing reflective assignments and learning documents in artifacts and also allows students to evaluate the effectiveness of teaching, assess their progress and take part in the final evaluation (Barrett, 2002; Wieseman, 2016). The second benefit is providing enrich formative assessment sources (Barrett, 2002; Lutovac, Kaasila, & Juuso, 2015). Using videos and e-portfolio allow student teachers to collect variety of evidence of pre-service teacher practice, guide personal inquiry, and inform teaching decisions regarding active student engagement. Collectively, video and e-portfolio help teacher students to assess their activities and progress and also gives evidence to assess peers effectively (Lutovac, Kaasila & Juuso, 2015). The third advantage is allowing pre-service teachers to identify their strengths and needs, modify perception of success, examine on-going student behavior in greater depth, and guide decision-making (Shepherd & Hannafin, 2008). Videos and e-portfolios became essential for professional development when they promoted the purposeful and systematic collection and examination of classroom artifacts (Shepherd & Hannafin, 2008). Last but not least, videos and e-portfolio are convenient and easily accessible (Barrett, 2002). Instead of storing bulky notebooks or boxes of artifacts, teacher-students can create, store and present their portfolios in an electronic format. Moreover, with the multimedia artifacts, student teachers could add various materials, products such as digital video, audio, still digital images, graphics, PowerPoint, Hyperstudio, text-based

reflections, observations of peers and other evaluators (Barrett, 2002). In addition, artifacts may be easily inserted as a file, scanned or uploaded to the portfolio (Barrett, 2002).

Notably, the effectiveness of using videos and portfolio depends on several factors. According to Wieseman (2016), obvious factors include self-efficacy and self-evaluation about abilities to perform electronic functions; degree of commitment and perseverance; time investment; technological issues related to hardware and software; and creators' and reviewers' knowledge of sophisticated electronic media (Wieseman, 2016).

Several studies propose specific strategies and models of videos and e-portfolio to apply in pre-service teacher education. Wiseman (2016) pointed out that adapting videos and e-portfolio in pre-service teacher education, teacher educators need to guide preservice teachers to reflect and electronically represent the professional, psychological, socio-historical, political, ethical, and moral aspects of themselves as educators. Some applicable models include cyber portfolio (Robles, 2012), Video-Stimulated Recall (Lutovac, Kaasila & Juuso, 2015), video annotation tools (Rich, 2007).

Apart from significant advantages of using videos and e-portfolio in pre-service teacher assessment, there is a number of pitfalls in practical implementation which are discussed in the next part.

2.4 Barriers in using videos and e-portfolio for pre-service teacher assessment

Before analyzing the barriers in using videos and e-portfolio for teacher assessment, it is necessary to discuss the challenges for ICT in teacher education in general. Despite the need for ICT in teacher education and huge investments of financial and human resources, pre-service teacher education programs do not provide teachers with necessary skills and competencies to enable them to use ICTs effectively in their future teacher profession (Gotkas, Yildirim, & Yildirim, 2009). Whereas, in the evolving 21st century teacher education, teachers have to succeed in their essential mission to be able to use technological innovations to their own learning process (Gotkas *et al*, 2009). It is evident that there are several barriers existing in the integration of ICT in pre-service teacher education programs.

Barriers can be classified into two categories: extrinsic (first order) and intrinsic (second order). "Extrinsic barriers include lack of resources, inadequate training, insufficient technical support and lack of time; intrinsic barriers include teachers' beliefs, visions concerning technology integration, and views about teaching, learning and knowledge" (Gotkas, Yildirim, & Yildirim, 2009, P.194). When it comes to ICT integration for assessment, there are more challenges to deal with. From the various studies, Mirzajani (2015) classifies barriers into three categories namely a) resource-related obstacles b) institutional obstacles and c) attitudinal obstacles.

a. Resource related obstacles

Resource related obstacles include lack of ICT equipment and tools, software and hardware complexities, lack of basic skills, lack of ICT knowledge, rapid changes in technology, inadequate software and tools, lack of technical support and demand for high-quality software (Mirzajani, Mahmud, Ayub, & Luan, 2015).

b. Institutional obstacles

Institutional obstacles include shortage of financial resources to invest in technology, lack of incentives, lack of rewards to encourage future teachers' usage of ICT, inadequate time given to teachers to learn and master the usage of technology and lastly the lack of sufficient commitment (Mirzajani et al., 2015).

c. Attitudinal obstacles

Attitudinal obstacles include anxiety in front of peers, beliefs that technology does not play a crucial role in learning, beliefs that ICTs are not user friendly, lack of self-confidence in using ICTs and negative experiences with using ICT in the past and lack of motivation or willingness to change (Mirzajani et al., 2015).

Becta classifies the barriers into 1) teacher-level barriers such as lack of time, lack of confidence and resistance to change and 2) school-level barriers such as lack of effective training in solving technical problems and lack of access to resources (Becta, 2004 *cited in* Bingimlas, 2009). Then specifically when applying videos and e-portfolio in assessment in pre-service teacher training, despite the various benefits and advantages, there seems to be certain disadvantages and the following section throws light on the challenges when applying videos and e-portfolio in pre-service teacher training. Most of the problems which student teachers experienced were related to digitizing artifacts and troubleshooting hardware and software and this largely falls into the issues pertaining to program implementation, access to and reliability of the technology, and the amount of time and effort expended (Wetzel & Strudler, 2006).

1. Program implementation issues

Changes in portfolio issues as they progress in their course leads to frustration among student teachers and this results in inconsistent implementation of portfolios which in turn leads to confusion (Wetzel & Strudler, 2006).

2. Access to and reliability of the technology

Access to e-portfolio tools and support is needed to student teachers and the reliability of the e-portfolio tools also seems to be a key factor as student teachers faced technical issues while using the e-portfolio (Wetzel & Strudler, 2006).

3. Amount of time and effort expended

A survey study shows that student teachers reported to have spent a lot of time on the e-portfolios such as time taken to upload the artifacts, time taken to reflect on the submission and uploading their scanned work were some of the major deterrents (Wetzel & Strudler, 2006). Smith, Harrison and Sammons also add that when multimedia requirements were added to the portfolio the time required was more. Some student teachers also felt that the mechanics of maintaining the portfolio became more important than the thinking and reflection (Wiseman *cited in* Wetzel & Strudler, 2006).

3. Methodology

3.1 Objective

The objective of this paper is to explore the practices of video and e-portfolio for assessment at a hodge school in Brussel, Belgium, where video and e-portfolio are employed for students' assessment. In particular, it examines the benefits these methods and applications are adding to the teachers training program, and the challenges towards their implementation. Literature suggests many different advantages of these tools for the purpose of assessment in teacher training program. However, the reality seems to be quite distant from the theoretical background.

This investigation aims at bringing better understandings about the college's program regarding the vision, the available resources and the implementation of ICT for assessment. The findings of the research will be analyzed and discussed based on the literature review, then suggestions are made with the intention to improve the effectiveness and cope with the challenges for teacher training programs regarding the use of video and e-portfolio in particular, and ICT use for assessment in general.

3.2 Research Questions and Boundaries

To meet the objectives, first of all, the research focuses on exploring the situation of how ICT tools including video and e-portfolio have been implemented for the purpose of assessment at the school. Then, when we already have a brief overview about how these tools are applied to assess teacher training program, the next steps are to investigate how teacher training program, that is, teacher educators and student teachers are beneficial from that. As the same time, barriers for the implementation of these tools in assessing students' performance are also taken into account. Thus, the questions are written as followed:

1. What are the practices for video & e-portfolio for assessment in the teacher education program at the selected hogeschool?
2. How does using videos and e-portfolios benefit pre-service teacher assessment?
3. How video and e-portfolio usage for assessment challenges teacher-educators and other stakeholders?

3.3 Research methodology

In addressing the research questions, the research design of case study was employed. As explained by Yin (cited by Baxter & Jack, 2008), case study is used when the focus of the research is on answering the *how* and *why* questions. Interviews were taken either in person or via Skype with different groups including managers or program coordinators, ICT team of experts and the teacher educators who directly implement the practice at the research site. After the interview with the program manager and the ICT expert working for the teacher training institute, we found a possible gap for further investigation which is the implementation of ICT tools for assessment, such as e-portfolios and videos. Accordingly, it was necessary to obtain views from different stakeholders and especially from teacher educators, in order to examine the implementation of these tools for assessing the student teachers of this program. To achieve this, e-mails were sent to the participants explaining the aim of the research and asking for their agreement to join the interview. The interviews that followed were with three teacher-educators,

one manager, one coordinator who are responsible for different subjects and domains in the selected hogeschool's teacher training organization (ICTO team). The type of these interviews was semi-structured and the questions were designed based on the theoretical framework about the issues in implementing e-portfolio and video tools for digital assessment. The attempt was to gain insights into how these tools were actually used in teaching practice and how challenging they were for being used in assessment process. The duration of each interview was no longer than 90 minutes.

The data analysis was done after that following the structure of our research questions. Data from the interviews was coded manually based on the themes pre-set from the research questions, then the findings were discussed using the theoretical framework in the literature review and in the broader context of the case. In this data analysis, we use coded name for our stakeholders which are: (M) is a director of teacher program in Brussels, (T1), (T2) and (T3) are teacher educators, (S) is the one who works in ICTO team.

Finally, after the discussion, specific suggestions were made to improve the use of videos and e-portfolio for assessment at the hogeschool in particular, and integrate the use of these tools for assessment in curriculum design in a more general context.

4. Findings and discussion

4.1 Overview about ICT integration in pre-service teacher assessment at the selected hogeschool

4.1.1 Teachers' belief and supports

The first theme of the interview is exploring participants' belief and vision about ICT in pre- service teacher assessment. The data revealed that all participants perceived, ICT was an effective approach to improve pre-service teacher training including assessment. All stakeholders agreed with the help of ICT to differentiate instruction, and to make student teachers more active and motivated as well as equip them essential ICT skills for the future (M, T1, T2). It was aligned with the findings proposed by West (2011). However, two participants argued that even ICT was an essential tool in teaching and learning, the role of teachers and face to face meeting are irreplaceable (M & T1).

Regarding the support, ICT integration in teaching and assessment at the research site was supported by 4 different teams namely a service desk to help with regular ICT problems; an operation team to run the servers; the developers or programmers; and the ICTO team which functions as “*a bridge*” between ICT and teacher-educator (S). Apart from this, “*media smart dayevent*” was organized annually for educators and student teachers to share their experience (M). Besides, according to all participants, the hogeschool equips various facilities to support ICT integration in teaching, learning and assessment such as iPad, smart board, iPhone, tripod, camera and so on. Significantly, supports and facilities were the leading conditions which effect the success or failure of ICT integration (Ali, Haolader & Muhammad, 2013).

4.1.2 Benefits and challenges of ICT integration in assessment

All the participants were in favor of technology, as long as it added some value to teaching. Accordingly, the first significant benefit was flexibility in time and space (T1&T2). In other words, students can learn at their own pace, at the most convenient time and in the

environment of their choosing. Also, technology allows educators to reach students faster by using tools and apps so to meets their needs (T1). Then, technology facilitates sharing of resources, expertise and experience (T1&T2) which enables collaborative teaching/learning and research. As mentioned by some teachers, web tools like Kahoot, allows educators/teacher to conduct a quick assessment regarding students learning progress in real time (T2 & T3).

Apart from discussed benefits, several drawbacks in ICT integration had been discovered from the interviews. One of the most obvious one is the potential for distraction (T1). One of the interviewees (T1) mentioned that while some students appear to follow the class they use a different tab for personal business (Facebook, YouTube.). Another challenge was the rapid changes in pace of technology. Whiteboard for example has been tech news just a few years before but it is fast becoming obsolete. In addition, when a new tool was introduced, it requires a long process of adaptation (S). Then, the limited time the educators have to invest into learning the new tools is also of great importance. According to (S), most of teacher-educators, demonstrate resistance because new applications (like panopto) put themselves out of their comfort zones. Lastly, the challenge of integrating ICT in teacher education was “technology costs” as mentioned by (S) and (M).

4.2 Using videos and e-portfolio in pre service teacher assessment at the selected hogeschool

4.2.1 The practice of using videos and e-portfolio in pre service teacher assessment

With the rapid growth of ICT, the assessment process involves the use of different technology. To keep up with the change, (M) reported that the institute has its own digital environment and used ICT tools for assessment. She also noted that an app is used in physical education for assessment. (S) revealed further details on how digital assessment at the hogeschool is “*integrated with Toledo Blackboard and assessment is done through questionnaires via multiple choices and surveys*”. (T1) noted that Google drive and portfolios were used for student’s assignments coupled with peer evaluation. (T2) seemed to use reports, learning labs, digital board, presentation and e-books for assessment in addition to the traditional methods such as oral and written exams, paper submissions and group work. (T2) also was “*moving towards online formative evaluation*”. On the other hand, (T3) used assessment methods such as quiz with Kahoot, self-evaluation and peer evaluation through assessment tools such as Excel.

Along with those practices, videos and e-portfolios were used as tools for assessment in teacher education at the selected hogeschool. These artifacts have been emerging as a trend in candidate assessment (Barrett, 2002; Lutovac, Kaasila, & Juuso, 2015). First, videos were usually embedded within the portfolios as tasks for student-teachers’s assignments (optional). Video lab application was used to “*upload files and to share them with the professors*”(S). In e-portfolios, several types of formative and summative assessment were included such as teacher assessment (formative and summative), self-evaluation, and peer-teaching (T1, T2, T3). Specifically, (T3) mentioned that “*portfolios act as a formative and summative assessment*” and research works indicate the strength of e-portfolio on how students can assess their progress in final evaluation (Barrett, 2002; Wieseman, 2016). The portfolios submitted by students are assessed individually and collectively along with other colleagues on the “*choices of the process and product*” (T1).

4.2.2 *Advantages of video and e-portfolio in assessment*

Regarding the video usage for assessment, the findings confirmed that videos is more interactive than paper based work. The possibility of more interaction is explained via the fact that students and their teachers can make annotations and integrate feedback directly in the video (S). Secondly, according to (T3), the most essential advantage of videos for assessment was that video recordings would be used like “evidence”. For example, video recording the student teachers' teaching practice allows mentors to review the class and provide feedback, especially if students do their internships abroad. Shepherd and Hannafin (2008) agree that when video are used during e-portfolio development, it enables student teachers to examine current practices and this serves as an additional evidence to strengthen claims. Then, another advantage of using video for assessment is that it offers more flexibility in teachers’ formative assessment since students can be exercised in real time and real environment which is very interesting and essential for some subjects such as medicine (S). Importantly, in line with the research by Barrett (2002), editing tools and using video applications such as VideoLab mentioned before, are user friendly and easy in their implementation, both for student-teachers and their professors.

For e-portfolios, all stakeholders agreed that it was beneficial for student-teacher as it facilitates reflection and cooperation. According to Shepherd and Hannafin (2013), the act of identifying, collecting, organizing and examining teaching artifacts to recreate events may help teachers reconstruct and improve their practice. Moreover, (T2) noted that using e-portfolio can also provide a “*chance for collaborative working*”. E-portfolio as a digital application, offers the freedom in time, place and flexibility in terms of collaborative working were essential elements. Hence, “*portfolio can be consulted from any place and in any time*” (T2). E-portfolio was believed to be able to bring “*huge benefit, everyone can consult the portfolio from wherever he or she is*”, and “*when something is unclear, we can just look it up on the computer whereas in the past it was always on paper*” (T2).

4.2.3 *Challenges for using videos and e-portfolio*

Along with the benefits discussed above, data from the findings also showed the barriers in using videos and e-portfolio as the assessment tools for students’ performance. First of all, the results indicated that there were extrinsic and intrinsic barriers, as argued by Ermert (cited by Gotkas et al., 2009). In the context of this case, the bigger barriers were found to be intrinsic. Accordingly, teachers’ vision about ICT integration and their belief about teaching and learning were found to be the most important challenge, especially for the videos. From the angle of the teacher educators, there was an attitudinal obstacle (Mirzajani et al, 2015), where they were not motivated or willing to change from traditional method to using these tools for assessment. Specifically, as T2 discussed, he preferred assessment on paper, especially when you “*can’t insert movie in a paper exam*”, or because “*open questions are better to be done on paper*”. Furthermore, one of the interviewees also shared that “*older teachers are not attracted to technology. They don’t see the need to change*” (T2); partly because they were “*not comfortable*” to use something new, and also because “*education in general is very slow moving, even if there are new possibilities*” (T2). The (M) and (S) also confirmed that it took time for trainers to get familiar to using the tools.

Besides, the extrinsic barriers were also explained by different stakeholders. Accordingly, the (S) agreed that it took time to mark the videos when the number of students were

large; while the teachers thought there were sometimes technical problems with the recordings such as students' files do not work on their computer (T3). Also, the student teachers should pay attention to the comfort level of people being filmed, for example asking for *permission* when video recording being used (S). Regarding the e-portfolio, though it was used by all teachers and students, there were also some technical problems reported, such as it is more difficult to “*flip through all folders*” to find one thing you need, or especially when the students submitted their tasks to the wrong folder (T2). In addition, though all stakeholders mentioned the “*media smart days*” for teachers and students to share experience about ICT integration, all the teachers reported that either they do not have time to join (T2, T3) or that it is insufficient for their professional developments; and they have to a lot of self- training (T1, T3).

In brief, the main barriers for the use of video and e-portfolio for assessment are about attitudinal and program implementation (Wetzel & Strudler, 2006). There are no barriers regarding the availability of the resources, and though being insufficient according to the teacher educators, the institution made great effort in supporting the implementation of the mentioned tools for assessment in their teacher training program.

5. Conclusion

The primary purpose of this paper was to explore the effectiveness of ICT tools for assessment in pre-service teaching program. By using a qualitative approach, case study was conducted at a hogeschool in Brussels, Belgium. Data analysis from five interviews with different stakeholders has showed positive results. The study has contributed to the literature of ICT integration in pre-service teacher assessment for some specific aspects.

Basically, the stakeholders recognized the effectiveness of videos and e-portfolio which enabled them to integrate this in the institution's curriculum. Videos and e-portfolios were seen to be valuable tools for formative and summative assessment of student teachers' performance. Facilities are good and sufficient to serve the initiative; technical support and guidance are well provided by strong ICT teams; and the school also has a very clear vision about the integration of ICT in their curriculum in general, and specifically in boosting the use of ICT for assessment.

In accordance to the existing body of knowledge, the benefits of using video and e-portfolio in this case were found to be supporting formative and summative assessment. E-portfolio is also seen as a reflective tool for students' self-assessment. Besides, the study also found that videos can be the evidence of students' work, and e-portfolio can increase the chance for collaborative working.

However, the more positive perception about the benefits of using ICT tools for assessment are from the management and technical team, not from the direct practitioners. Specifically, there is still a limited usage of these tools among the teacher educators, which is far from the expectation of the tool development team. Reasons for the limitation were found to come from the teacher educators themselves rather than from external obstacles. Accordingly, teacher educators believe that they do not feel the need for ICT tools in assessment; since they do not feel comfortable with using ICT, especially with the older generation; or they believe assessment will be more effective with the traditional method. This is partly the responsibility of the school managers. Despite the availability of annual workshops to share their ICT experience, teachers feel it insufficient to change their everyday practice.

In short, the study has revealed that, the obstacles towards ICT integration inclined towards the process of implementation and not on the curriculum design. Hence, these practical challenges call for some potential recommendations to better implement ICT integration for assessment in pre-service teacher training in the selected hogeschool, which will be described in the final part.

6. Recommendations

As mentioned above, the main challenges for the use of video and e-portfolio, or ICT tools for assessment in general, at the selected institution was more attitudinal. Therefore, program developers and/or curriculum designers could take this into consideration when they want to effectively integrate ICT in the teacher education program. First and foremost, efforts should be made to influence teachers' beliefs. As stated by Ericsson, Krampe, and Tesch-Romer (1993), in order to ensure the practice to be successful, individuals must be motivated and willing to exert effort to improve their performance. That refers to the growth mindset within the teacher education program as proposed by Dweck (2006).

Then, considering the advantages of ICT integration, it is necessary to suggest strategies to make the benefits of videos and e-portfolio explicit. This requires more opportunities for teacher educators to get more confident and familiar with ICT for education and in favor of assessment. Thus, organization can invest on teacher's professional development, by organizing internal and external workshops or seminars, encouraging teacher educators to actively participate and engage in technology, and showing practical examples for efficient and sustainable solutions. In the end it is also important that teacher-educators take responsibility to devote time and effort to reflect on their beliefs and attitudes towards ICT.

Last but not least, during the implementation process, feedbacks from teacher educators should also be incorporated. These can help the management and ICT team to learn about the challenges that teacher educators face and find other appropriate strategies towards successful implementation.

Even though this study does provide a good picture of the use of ICT in assessment, its scope is just limited to one hogeschool with the perspective from a small number of attendants, and the ICT tools were also narrowed down to only video and e-portfolio, future research is needed to examine the implementation and effectiveness of ICT in assessment on a larger scale, or on other application of ICT for assessments.

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ỨNG DỤNG CNTT TRONG ĐÁNH GIÁ ĐỐI VỚI CHƯƠNG TRÌNH SỰ PHẠM – TRƯỜNG HỢP VIDEO VÀ E-PORFOLIO

Tóm tắt: Bài báo trình bày về các thách thức và cơ hội đối với việc ứng dụng video và e-portfolio làm công cụ để đánh giá trong chương trình đào tạo ngành sư phạm thông qua nghiên cứu trường hợp tại một Trường Đại học ứng dụng ở Bruxelles, Bỉ. Các mục tiêu của bài báo bao gồm tìm hiểu về thực tế việc sử dụng video và e-portfolio vào quá trình đánh giá đối với sinh viên ngành sư phạm, cũng như những thuận lợi và khó khăn trong việc ứng dụng các công nghệ này vào quá trình dạy và học. Để thực hiện nghiên cứu, phương pháp phỏng vấn mở và phương pháp nghiên cứu định tính đã được sử dụng để thu thập và phân tích dữ liệu. Kết quả nghiên cứu cho thấy, mặc dù có sự ứng dụng mạnh mẽ CNTT trong chương trình đào tạo, đặc biệt là trong mảng đánh giá, nhưng thực tế ứng dụng các công nghệ này vẫn còn nhiều hạn chế về tầm nhìn và niềm tin của các giáo viên ngành sư phạm. Trong bối cảnh của nghiên cứu này và dựa theo cơ sở lý thuyết liên quan, bài báo sẽ đề xuất một số biện pháp để nâng cao việc ứng dụng CNTT vào việc đánh giá đối với chương trình đào tạo sinh viên ngành sư phạm.

Từ khóa: Đánh giá sinh viên sư phạm, CNTT, đánh giá, video, e-portfolio