Use of Electronic Portfolios in Elementary School to
Enable Multiple Means of Representation of Student Work:

Final Paper

Word Count: 2892

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April 1, 2011
Abstract

This paper explores current literature on student portfolios, both paper and electronic to understand if using electronic portfolios in elementary school settings can enable multiple means of representation of student work within the framework of Universal Design for Learning (UDL). The purpose of this investigation is to propose a new vision of integrating technology into my teaching context, grade one, French Immersion.

Following the literature review, a discussion regarding how technology is currently integrated in my classroom, the challenges and barriers to technology integration, and how these challenges and barriers can be addressed is explored.

*Keywords:* Electronic portfolio; Universal Design for Learning (UDL); K-12 education
Use of Electronic Portfolios in Elementary School to Enable Multiple Means of Representation of Student Work

A typical K-12 classroom is comprised of students with diverse learning needs. Educators are charged with providing each student with the appropriate instructional support and challenge. As stated in one of my assignments for ETEC 532, “Young people (students, learners) have a new way of looking at the world, and presently, there is a fundamental mismatch, in some cases, between teachers, their pedagogy, and their students. Learning is changing. We are relying more on technology and learner networks to access knowledge that exists outside of the individual. By involving students in the process, “they are learning how to participate in a learning and thinking culture, one that encourages them to make things with their hands and heads” (Jacobsen & Goldman, 2001, p.95).

I am interested in researching if the integration of electronic portfolios (EP) in the elementary school setting can enable multiple means of representation of student work within the framework of Universal Design for Learning (UDL). My interest in this area stems from studying UDL for the past two and a half years at the school where I teach. UDL is one of the projects at the forefront of the Calgary Board of Education (CBE) as we are focused on the personalization of student learning. The UDL framework proposes that educators strive for three kinds of flexibility: (a) representation, to represent information in multiple formats and media, (b) expression, to provide multiple pathways for students action and expression, and (c) engagement, to provide multiple ways to engage students’ interest and motivation. Educators work towards flexibility by
identifying and removing barriers from their teaching methods and curriculum materials.

Implementing the three UDL principles with new media can help educators improve how they set goals, personalize instruction, and assess student progress. (Rose & Meyer, 2002)

Teaching within the framework of UDL has been identified as one strategy to work towards achieving the CBE’s (2010) Ends 1: Mega End policy which encapsulates the desired outcome for all of our students – completing high school with the foundation of learning to function effectively in life, work and future learning. The outcomes of the Mega End are reasonable progress towards Ends 2: Academic Success, Ends 3: Citizenship, Ends 4: Personal Development and Ends 5: Character. In this paper, I propose that having students create personal electronic portfolios could be one method for teachers to teach within the UDL framework, while utilizing existing technologies available to all CBE students. The CBE uses Desire 2 Learn (D2L) as a Learning Management System (LMS), which affords every staff member and student an EP (see Figure 1). An EP is “a digital container capable of storing visual and auditory content including text, images, video and sound. EPs may also be learning tools not only because they organize content but also because they are designed to support a variety of pedagogical processes and assessment purposes” (Meyer, Abrami, Wade, Aslan, Deault, 2010, p. 85).

Since the 2009-2010 school year, I have enrolled my grade one students in the classroom shell that I created in D2L. The purpose of this shell is to post classroom news events, high frequency word lists, links to educational websites and photos of our learning. As a class, we access our D2L shell at school using the SMART Board, also known as an Interactive White Board (IWB), and many students, though not all, access it
from home. Through my trials using D2L, I developed an interest in integrating the EP tool into my teaching practice. It would fulfill the principles of UDL and as a tool that would personalize learning, as students would have the ability to create their own content and self-regulate their learning.

Figure 1. e-Portfolio Graphic, Calgary Board of Education. This figure illustrates the effective elements of an EP according to the CBE.
Literature Review

Purpose for the electronic portfolio (EP)

Barrett (2007) points out that there is very little research about electronic portfolios in the K-12 student context. Nonetheless, there are many teachers who advocate the use of portfolios, print and electronic, as a tool that can “support reflection that can help students understand their own learning and provide a richer picture of student work to document growth over time” (Barrett, 2007, p. 436). Furthermore, “EPs can offer valuable opportunities for integrating technology into the K-12 classrooms. Not only because they are multimedia containers, but in ways that deepen students’ learning experiences by placing the student at the centre of his/her learning and scaffolding essential metacognitive skills such as goal setting, identifying strategies, and reflecting on one’s learning” (Meyer, Abrami, Wade, Aslan, Deault, 2010, p.84). I would also argue that an electronic portfolio might provide students with multiple means of representing their learning.

According to Meyer et al. (2010), “EPs have three broad purposes: process, showcase, and assessment” (p. 84). Paper-based portfolios have been around for a substantial number of years and much of what we have learned can be applied to EPs and how we can give students ownership of their portfolio. Hebert (as cited in Barrett, 2007, p. 442) demonstrates how, over time, the student gains and maintains ownership. Portfolios have changed from a folder of student work, to a collection of student work, to a teacher-organized portfolio, to a showcase portfolio, to a progress portfolio, to a teacher-and-child organized portfolio and finally to a student-organized portfolio meant to “encourage individual improvement, personal growth and development and a
commitment to life-long learning” (Meyer et al., 2010, p. 85). An EP is a student-organized portfolio because the student creates it. Furthermore, Barrett (as cited in Meyer et al., 2010) proposes that EPs “can also provide remote access encouraging anywhere, anytime learning and easier input from peers, parents and teachers.”

Assessment

There are many benefits to EPs. Barrett (as cited in Meyer et al., 2010) states that “they provide multimedia display and assessment possibilities for school and work contexts allowing the use of a variety of tools to demonstrate and develop understanding – especially advantageous for at-risk children whose competencies may be better reflected through these authentic tasks. Also, Benson and Smith (1998) state that students learn the skills of self-assessment. However, self-assessment does not happen naturally. For example, many teachers express concern that students are not as actively involved in the selection of work for their portfolio as they should be. This is often the case in lower elementary as the teacher frequently chooses the work the student will showcase. However, through their qualitative study of portfolios in grade one, Benson and Smith (1998) identified three major strategies to help young students self assess: (1) teacher modeling of appropriate assessment techniques, (2) student practice in selecting work samples for the portfolio at the “Portfolio Center”, and (3) students sharing their portfolios with peers and teachers using the videotaping process. All three of these strategies “seemed to have a positive impact on the students’ ability to make decisions about their individual growth and development” (p. 178).

In contrast, Dudley (2001) argues against the use of portfolios as a form of assessment. “Assessment calls for the application of a set of standards embodied in a
rubric and compares the achievement of students to these standards. This comparison, this assessment, should be accurate, timely, and practical in terms of time and energy required. The use of portfolios for assessment lacks these qualities” (Dudley, 2001, p. 19). One could argue then that the goal of the student portfolio is not for assessment and that work included in a student portfolio should have already been assessed. The assessment piece of the portfolio transitions to self-assessment, an opportunity for reflection that might otherwise not be provided.

**Synthesis of Emergent Themes**

Based on the articles analyzed in the literature review, a central emerging theme is portfolios, print or electronic, focus on student-centered learning. A portfolio can provide teachers with “multiple assessment strategies needed to validate the multiple ways students make sense of their learning” (Smith, n.d.). This is consistent with the views on metacognition of Meyer et al. (2010). Students hold important information about what they know and how they know it. The portfolio affords students a space where they can “connect both the pieces of work and experience into the larger context of their learning, and to see how each piece and experience impacts the others” (Smith, n.d.).

The research studies reviewed indicate a student portfolio should be created for the purpose of student self-assessment. As we move from paper-based portfolios to electronic portfolios, students are provided with a more flexible environment for representation and expression of their learning, which has been shown to improve student learning. This is consistent with the principles of UDL. As educators, we can provide the best support by personalizing pathways to learning. EPs allow all students to pursue a
common goal by following their own path and obtaining a level of performance that represents their personal progress.

Discussion

Current Technology Integration

I teach grade one, French Immersion in a K-6 elementary school with a student population of 620 students. We have 11 SMART Boards installed in classrooms, which is approximately one SMART Board for every three classrooms. Our Division II classrooms have at least three desktop computers in each classroom, however only about half of our Division I classrooms have a desktop computer. We do not have a computer lab due to lack of physical classroom space. We are a wireless building and we have one laptop cart, with 15 MacBook computers on it. We have just acquired 10 iPod touch devices as well. The technology that we have in our building is insufficient in meeting our teaching and learning needs. 15 student laptops between 620 students is a ratio of 1 laptop for every 41 students and 1 iPod touch for every 62 students.

In Alberta, each teacher has been given a laptop as a result of a provincial wide 1:1 laptop initiative. These laptops are not for student use, however, when it is the only computer in a teacher’s classroom, there is no choice but to have students use them as well. In my classroom, I have a SMART Board, which is hooked up to my teacher laptop. Due to the difficulty of signing out the laptop cart, technology integration in my classroom has been limited to student use of the SMART Board during literacy centers.

Challenges and Barriers to Change

As mentioned above, the technology available in my school for student learning is insufficient. However, teachers have become creative in how they have maximized what
is available. For example, I frequently sign out three laptops from the cart and use them for the morning in my classroom as a literacy center. Normally, I prepare the students by modeling on the SMART Board what I would like them to do. This tends to work very well as I am not having to manage all 18 grade one students on the computers at the same time and the small groups of 3 students are able to help each other troubleshoot. During this time, two students would be working in another literacy center at the SMART Board. One student assumes the role of a pilot who is “hands on” the SMART Board and the other student is a co-pilot who is “hands off” the SMART Board, but available to offer verbal support and reminders. After a set amount of time, the students exchange roles. By integrating a few laptops and the SMART Board during literacy centers, by the end of each week, each student in the class has had the opportunity to learn with technology. This is a solution, however, learning with technology in my context must be planned out in advance, which does not allow for seamless integration, or “just-in-time” teaching.

The Calgary Board of Education uses a Learning Management System called Desire 2 Learn (D2L). Within D2L, there is an EP tool. This is the tool that teachers are expected to use with students, in contrast to other tools such as public blogs or wikis, which could be used to create and display an EP. The main reason for this is to protect student information and privacy, which is certainly a concern, however, I believe that the EP should be kept separate from the LMS. Barrett (2007) states, “In order to approach a balanced solution, we must envision a system that makes it easy for students to maintain their own digital archive of work, where they can display a large number of examples and add reflections and notes in an ongoing way, perhaps in a learning journal” (p. 440).

Although D2L affords a multitude of tools as a LMS, I feel that the EP tool is not
ideal for students as it can be difficult to navigate. Furthermore, Barrett (2007, pp. 440 - 441) lists the following reasons to keep the learner EP separate from the LMS:

- The tools should allow the learner to feel in control of the process, including the look and feel of the portfolio;
- Emotional connection – There is an affective component of the portfolio development process that supports deep learning;
- Learners’ authentic voices – As learners create their own electronic portfolios, their unique “voices” should be evident from navigating the portfolios and reading the reflections on the screen;
- Learners’ portfolios should help them tell a story about their growth and development over time;
- The tools used to develop the portfolio should be accessible to a learner throughout their life;
- Constructivist model supports deep learning – Hyperlinking leads to metacognition, which leads to deeper learning. Whenever possible, learners should have the opportunity to plan and assess their own learning.

As educators, we are used to being flexible in order to do our best work with the resources and tools that we have. When a school board decides on tools, such as an LMS, for teachers and students, they must take into consideration the demographic that will be using the resource. I definitely see the value in using EPs with younger students, however, with the lack of laptops available and the difficulty of navigating D2L, it seems like an insurmountable task.
Solutions

Electronic portfolios provide students with a space to represent and express their learning in multiple means of representation, and therefore, are an ideal tool to use within the framework of Universal Design for Learning. That being said, in my context, the EP tool available to my students in D2L is difficult for grade one students to manage on their own. My solution to this is either to work one-on-one with my students or to have older students partner with younger students to assist them with the technical aspects of uploading their projects to their EP.

Another possible solution would be to look at simpler alternatives to D2L in terms of usability for younger cohorts of students. I believe it is very important to keep Barrett’s (2007) points regarding keeping the student EP separate from the LMS in mind. Having students create EPs gives them ownership of their learning and I am not sure if this can genuinely happen when the tool is prescribed.

If in fact there is no other option, which is the case in my context, a reasonable solution would be for the teacher to model the creation of an EP by creating a classroom EP together. As students gain technology experience as a group, they will be well positioned to create their own EP when they are ready, based on their skill set or when they enter a higher grade. By learning the platform and technology together in the early years, students will be able to help their peers when the time comes to create their own EPs.

Conclusion

Based on the research that has been presented in this paper, I believe that the integration of electronic portfolios (EP) in the elementary school setting can enable
multiple means of representation of student work within the framework of Universal Design for Learning (UDL). Likewise, there are many challenges and barriers preventing EPs from being a tool that is used by teachers and their students. The use of an EP is student-centered and can encourage students to think about their learning and represent and reflect on what they know. As with any technology, the trick is to figure out how best to integrate the tool so the needs of the student and teacher can both be met.
References


Vignette Analysis submitted as part of the course requirements for ETEC 532.


