Abstract: The purpose of this paper is two-fold. First, the authors will synthesize current literature pertaining to e-portfolios in order to identify best practices for their use as an assessment tool. Second, the authors will examine how Web 2.0 technologies present new opportunities for easily creating dynamic content and meeting user needs such as privacy and lifelong access. E-Portfolios have found a fairly consistent place in higher education, but along with consistency often comes complacency; reflection is sacrificed for efficiency and the benefits of new technologies are overlooked in order to maintain familiarity. This paper will provide educators with processes that allow them to assess students in a manner that is meaningful to both student and instructor, using technologies that make the experience innovative and user-friendly.

Keywords: instructional technology, e-portfolio, Web 2.0, assessment, education

I. BACKGROUND

Amidst the digital fads of education that have come and gone, the e-portfolio has remained and even grown in popularity. This popularity is not relegated to one specific academic area; a search of literature pertaining to e-portfolios reveals results in diverse areas such as art, education, medicine, writing, and more. In addition, their appeal spans all academic levels, from elementary to higher education. According to Clark and Eynon [9], the popularity of e-portfolios can be attributed to four factors: (a) a resurgence in pedagogical focus on student-centered activities, (b) a growth in digital resources, (c) increased demands for accountability, and (d) the need for portable learning tools.

e-Portfolios are used for a variety of purposes, and many labels have been assigned to them. While one author [17] identifies the types of portfolios as documentation, process, and showcase, others identify them as developmental, presentation, and assessment [23]. Because of differences in use and characteristics, Meeus, Questier, and Derks [24] find it “impossible to give a simple and unequivocal description” of e-portfolios (p. 135), opting instead to assign a set of general features: (a) student-centered, (b) competence-oriented, (c) incorporating reflection, and (d) multimedia-oriented. One of the widely accepted definitions proposed by Barrett [2] emphasises the main features of this instructional tool:

A portfolio is a collection of work that a learner has collected, selected, organized, reflected upon, and presented to show understanding and growth over time. Additionally, a critical component of a portfolio is the combination of a learner’s reflection on the individual pieces of work (often called artifacts), as well as an overall reflection on the story that the portfolio tells. (para. 2)
This process of collecting, selecting, organizing, reflecting upon, and presenting addresses the student-centered nature of e-portfolios identified by other authors. According to Estes [14], student-centered learning puts power in the hands of the learner, fosters collaboration, and focuses on activities that are useful and relevant. In creating and reflecting upon e-portfolios, students are challenged and empowered to think not just about what they learned, but about how they learned. Although this can be a short-term exercise, ideally the learner is provided with continuous opportunities for reflection [22, 23]. In these circumstances, when students can keep working on them throughout the learning period, e-portfolios provide the benefit of continuous improvement, as students do not see them as definitive [1]. This extensive reflection opportunity is cited by Lewis and Baker [19] as the e-portfolio’s greatest advantage. It also contributes to the development of metacognitive skills, allows the student to view learning as a process, and provides an effective means of assessing that process [10].

II. BEST PRACTICES IN E-PORTFOLIO ASSESSMENT

Assessment is generally categorized as formative or summative. Barrett [2] describes the differences in formative vs. summative e-portfolios as follows:

In implementing [formative] portfolios, artifacts are selected by students to tell the story of their learning. The portfolio is maintained throughout a class, term or program. The portfolio and artifacts are reviewed with the learner and used to provide feedback to improve learning. In contrast, when looking at [summative] portfolios… students submit specific required artifacts that are mandated by the school to determine outcomes of instruction. Summative portfolios are usually developed at the end of a class, term or program. These portfolios are often measured based on a rubric and quantitative data is collected for external audiences. The summative portfolio is structured around a set of outcomes, goals or standards and is sometimes used to make high stakes decisions. (paras. 6-7)

In relationship to e-portfolios, purely summative assessment has been criticized. Beck, Livne, and Bear [5] noted this criticism and conducted a study with the purpose of determining which type of portfolio best supported professional development of graduate students in an education program, one which focused on reflection and development (formative), or one with the goal of demonstrating that certain standards had been met (summative). Participants were divided into four e-portfolio groups with the following foci: (a) reflection and accountability, (b) accountability (c) reflection and collaboration, and (d) dialogically-based reflection and collaboration. Results showed that those who created the summative portfolio with a focus on accountability fared most poorly in overall teacher development.

The Beck et al. [5] study may seem contradictory to the aforementioned study which indicated that e-portfolios have grown in popularity due to accountability measures. Chambers and Wickersham [8] refer to this as the “conflicting paradigm” of assessment for learning versus assessment of learning (p. 352); however, perhaps this does not have to be an either/or situation. Perhaps, as Chambers and Wickersham further state, there can be a balanced approach that meets both the need for accountability and the need for student development. For example, like its more formative counterparts, the hybrid portfolio in the Beck et al. [5] study did achieve positive results. In addition, the use of formative e-portfolios have been known to complement, or lead to, summative assessments such as examinations or capstone projects [6,10].

A review of the literature pertaining to portfolios and assessment certainly reveals that accountability and personal development do not have to be mutually exclusive. In examining a paper-based portfolio process that had both formative and summative qualities, Farr Darling [15] came to the conclusion that portfolios were valuable in evaluating student performance because they provide an opportunity for holistic assessment. The author further noted that, in order to make the process as meaningful as
possible, certain areas need to be addressed prior to implementation. In synthesizing the findings of Farr Darling and numerous other authors, the following issues emerged as critical in the process of developing meaningful e-portfolios:

- Clarity of purpose
- Clear Evaluation Criteria
- Collaboration
- Reflection

As with any other educational tool, the effective use of e-portfolios is dependent upon having a clear idea about the instructional purpose. Defining evaluation criteria would be the next pivotal point in using e-portfolios in terms of student assessment. Collaboration, including the interaction among students and between student and instructor, fosters collegiality and improves performance. Finally, the essence of the e-portfolio concept is the process of reflection, making connections between the past and the present in order to shape the future. In the following sections, these best practices for educational use of e-portfolios will be examined in-depth.

2.1 Clarity of Purpose

As previously indicated, the e-portfolio is ideally used in a long-term capacity, the minimum of which would be the duration of a course. The primary purpose of this is to allow for depth of reflection and continuous learning; however, a possible secondary benefit is that students are able to demonstrate a pattern of achievement and/or growth, and perhaps even use the e-portfolio for outside purposes such as applying for jobs, scholarships, or other selective opportunities [22]. There are a wide variety of purposes for creating an e-portfolio, assessment being one of them, and it is the purpose of the e-portfolio which dictates its design and content [19]. Students, however, are not always clear on the purpose of the e-portfolio they are charged with creating [8], nor can they make the connection between its purpose in the classroom and its potential use outside of the classroom [7]. It is, therefore, essential that the e-portfolio task is developed with clarity of purpose in mind. More importantly, the purpose and the value of the e-portfolio must be clearly communicated [4, 7, 19].

In a study of teacher education programs that had used e-portfolios for two or more years, Wetzel and Strudler [29] noted that clarity of purpose was a recurring theme when experienced users were asked about their recommendations for those interested in implementing e-portfolios. Specifically, the researchers indicated that it was the recommendation of users that the purpose was clarified for all stakeholders involved in the e-portfolio process, stakeholders including anyone who has an interest in the project. For example, in this particular study of teacher education programs, one school representative clarified stakeholders as faculty members, students, technology persons, and K-12 personnel. Wetzel and Strudler used the following faculty member’s discussion as an example of the importance of clarity of purpose:

I think you need to focus on what the purpose or purposes of these portfolios are going to be. And I don’t think we did that. As we said repeatedly, we saw it as an electronic briefcase, a collection of your work and nothing more, when in reality we knew we wanted it to be above that. And it was going to involve artifacts from courses. So get your objectives out there, your purposes… (p. 239)

In reviewing the process of using e-portfolios to document the professional growth and learning of medical educators, Lewis and Baker [19] also recognized the necessity of establishing the purpose of the e-portfolio prior to construction. The authors discussed a set of guiding questions that can help clarify the scope and purpose of an e-portfolio (e.g. Who is the target audience? What types of artifacts will be included? When and how should the e-portfolio be evaluated?). These questions offer insight into issues that should be taken into consideration during this process, including the target audience, type of content, design processes, and method of evaluation.
2.2 Clear Evaluation Criteria

An important step in ensuring fair and meaningful assessment is familiarizing students with the manner in which they will be evaluated [4]. According to Lynch and Purnawarman [21], “clear, established and reliable standards, including a concise rating system to describe acceptable performance and competencies, are essential in portfolio assessment” (p. 52). Regardless of whether the goal is assessment of learning, assessment for learning, or a combination of both, there will inevitably be certain learning outcomes or processes that will be of interest to both student and assessor. Examples of such outcomes or processes can be anything from specific knowledge and skills to evidence of certain attitudes or self-regulating actions.

Portfolio development, whether formative or summative, is often viewed as an authentic method of assessment in that it involves real-world applications. However, these types of processes and products can prove difficult to evaluate, especially when it is hard to separate the process from the product, or the process is as important, or more important, than the product [28]. Rubrics are commonly used in assessing e-portfolio products and/or processes [1, 21], but they are certainly not the only means of evaluating learning. Although a thorough analysis of measurement and evaluation methodology in relationship to authentic assessment is beyond the scope of this article, it is worth briefly mentioning other evaluation methods identified by Thorndike and Thorndike-Christ [28] for performance and product evaluation. For example, the authors recommend the use of checklists for evaluating processes that focus on the presence and/or absence of certain behaviors or characteristics. In addition, rating scales can be used to identify the quality and frequency of certain behavioral or characteristic occurrences, although they are more time consuming than checklists in evaluating processes.

Regardless of the method of evaluation, the expected standards should be communicated in advance. It is difficult to separate the standards from the content and, therefore, this must also be taken into account and clearly communicated along with the evaluation criteria. Wetzel and Strudler [29] discovered the importance of developing balanced expectations for content, stating that the amount of content should be enough to satisfy competencies, yet not so much that students view the process of creating the e-portfolio as busy work. A balanced approach should also be taken when providing choice in the selection of content. Mason, Pegler, and Weller [23] found that, while allowing students to choose their own content maintains the student-centered nature of e-portfolios, providing too much choice can result in students feeling overwhelmed. The researchers also included the caveat that it takes “a relatively sophisticated, self-directed and confident learner to really benefit from this strategy” (p. 724). The obvious implication of this statement is that instructors should implement scaffolding strategies in the absence of these characteristics.

Instructors are not the only assessors of e-portfolio projects. A key component in building metacognitive and self-regulating skills, and a recurring theme throughout the literature on e-portfolios, is the opportunity to self-assess and assess one’s peers. These activities are so beneficial in building autonomous learners that authors such as Bauer and Anderson [4] believe that the incorporation of peer and self-assessment are a requirement for effective e-portfolio development. The idea of self-assessment resulting in self-awareness is fairly intuitive and the process, while perhaps not always implemented in the most effective manner, is still implemented quite often in e-portfolio development. Peer assessment also assists students in developing self-awareness, but is practiced less with e-portfolios. In having the opportunity to view and evaluate e-portfolios created by other students, learners are naturally inclined to compare these projects to their own and subsequently make improvements [1]. Including both processes, assessing self and assessing others, maximizes the potential for deeper learning and higher quality products; however, both are hindered when students are ill-equipped to engage in them.

Effective peer and self-assessment will not happen without guidance, training, and opportunities for practice. Just as there should be clear evaluation criteria for instructors as assessors, students as assessors should receive this same benefit. Bierer, Dannefer, Taylor, Hall, and Hull [6] provided this guidance for medical students through the use of self-assessing questions. Lynch and Purnawarman
[21], on the other hand, recommend the use of a rubric, while Beck et al. [5] used a rating scale. More important than the method of evaluation is the clarity with which it is explained to the student assessors, the opportunities for practice, and the feedback received after this practice.

Thus, e-portfolio-based assessment is ideally a collaborative effort between an instructor, the student, and the student’s peers. In both cases a variety of evaluation methods are available such as rubrics, checklists, and rating scales. Regardless of the method employed, defining clear evaluation criteria is the crucial element for successful assessment.

2.3 Collaboration

The effectiveness of peer assessment is indicative of the value of collaboration, another practice in e-portfolio assessment that was mentioned continuously throughout the literature. Barbera [1] conducted a study involving two groups of e-portfolio creators, one with minimal and only voluntary collaboration, and the other with each student contributing their e-portfolio to a network of other e-portfolios (referred to as a netfolio), and exchanging comments. Barbera found that the netfolio users engaged in more revisions and concluded the process with higher quality e-portfolios. This result is a reflection of the power of peer assessment, as previously mentioned. Engaging in collaboration, however, is not just valuable because of its effect on the quality of student work or the improvement in metacognitive skills. Mason et al. [23] provided one university’s assessment of collaborative learning with e-portfolios or, as they referred to them, webfolios:

The webfolios provide a new perspective on student evaluation where students would learn to experience the synergy of collaborative learning rather than competitiveness experienced during testing or examinations. By sharing their resources obtained with one another, students become true partners in learning and develop their professional collegial relationships while they are in class. This also will overcome the isolation often felt by the students in distance learning classes. (p. 718)

In addition to fostering a collaborative relationship among students, e-portfolios can help improve collaboration between a student and the reviewer of the e-portfolio (instructor, tutor, advisor, etc.). Reading student reflections and observing the learning process via an e-portfolio can help a reviewer identify the student’s progress, or lack thereof, and influence the direction of instruction or advising. Bashook, Gelula, Joshi, and Sandlow [3] found that the use of e-portfolios improved advisors’ relationships with first year medical students in that they were better able to understand the students’ maturity levels, as well as their beliefs, behaviors, and potential challenges. Several authors also noted that this type of information can provide a basis for discussions and interactions between the student and reviewer [10, 13, 18]. Of course, the richest information is gleaned from student reflections.

2.4 Reflection

If there is one best practice that can unequivocally be associated with an e-portfolio, it is that of reflection. A literature search (Database: Academic Search Premier) failed to disclose any studies that did not address reflection in e-portfolio development. The reason for this is that, without reflection, the e-portfolio is really nothing more than an online storage device. It is through the reflective process that a student is able to “see” their learning, and take note of how seemingly separate activities are really not so separate after all. Miller and Morgaine [25] summarize the benefits of reflection as allowing students to: (a) build personal and academic identities, (b) make learning connections, (c) develop self-assessment skills, and (d) plan academic pathways through the development of metacognitive skills.

The essence of reflection is making connections between the past and the present in order to shape the future. Reflection improves practice when an individual compares and contrasts experiences, analyzes the actual versus the desired, critically evaluates current assumptions and understandings, and makes modifications as a result [11, 24]. The problem is that this process is complex and difficult for most students. Nevertheless, many instructors have a tendency to demand reflection from students who have no idea where to begin or what meaningful reflection even looks or feels like, the result of which is
insincerity and resistance. Ruiz et al. [27] found that students viewed reflections as tedious, redundant, time-consuming, and even demeaning due to the fact that they were specifically asked to reflect on their weaknesses. One of the factors to which the researchers attributed the students’ resistance was lack of training and familiarity with the reflection process, an assumption that is probably quite accurate. Just as assessors should be trained in evaluation methods, students should be trained in how to reflect and the purpose of reflection. Instructors should discuss the reflection process, clearly define what it means, and demonstrate how it works [16].

III. NEW DIRECTIONS

The instructional value of e-portfolios has been recognized by educators since the 1990’s. The current trend in using e-portfolios as a part of the school curriculum indicates that this tool will continue to be a point of interest for both researchers and practitioners across many academic disciplines in higher education. Recently, the emergence of Web 2.0 has reinforced the e-portfolio concept, improving its usability in a variety of educational settings. The body of literature [12, 26, 30] indicates an increasing potential for merging Web 2.0 tools with e-portfolios to create a dynamic approach to student assessment. Undoubtedly, the new direction in e-portfolio development is associated with ever-growing Web 2.0 technologies that are open-source, flexible, interactive, and accessible. Furthermore, the cloud-computing nature of Web 2.0 applications helps schools overcome difficulties in hosting and maintaining e-portfolios, allows students to dictate their own privacy settings, and satisfies the need for access beyond the course, term, or school experience.

The Bologna Process, a reform movement aimed at creating a unified, yet diverse, higher education system throughout Europe, has recognized e-portfolios and Web 2.0 as integral parts of the future development of European higher education. As discussed by Loureiro, Moreira, and Gomes [20], learning via e-portfolios is more comparable, visible, portable, and transparent, which are four main principles of the Bologna process. In regard to Web 2.0, the authors pointed out that e-portfolios based on Web 2.0 tools enhance learning “through mechanisms based on the concept of collective intelligence” (p.57). This concept of “collective intelligence” may be associated with the process of collective reflection, or peer assessment, which is one of the main instructional components of the e-portfolio.

In the same vein, Clark and Eynon [9] reported that e-portfolios are not just a focus of American higher education policy, but have also taken a place in European educational systems due to the Bologna Process’ aim of providing transferability of education. These authors argue that the expansion of the e-portfolio as a tool for assessment parallels the rapid development of Web 2.0 technologies that are used as software platforms for creating student e-portfolios. Although fairly new, Web 2.0 tools have significant advantages over commercial software platforms (e.g. learning management systems) and applications. For instance, Clark and Eynon stressed that the visual richness of Web 2.0 may be significant for designing a personal e-portfolio. Typically, students are more passionate about presenting themselves through a combination of text, images, audio, and video, than using text alone. It seems that multimedia representation of e-portfolio content has already become a widely accepted trend. Therefore, a multimedia approach, supported by Web 2.0, may be considered one of the future directions in developing e-portfolios as an assessment tool.

Researchers and practitioners face a complex task in attempting to predict the future of e-portfolios in a world of ever-changing academia, growing Web technologies, and market demands. However, based on current research, some general directions can be outlined:

- The future of e-portfolios is closely tied to the development of Web 2.0 tools.
- Accessibility, flexibility and interactivity of e-portfolios may be the main factors that will shape the face of e-portfolios.
- There will be an increasing inclusion of multimedia in designing e-portfolios.
- e-Portfolios will contribute to the transparency, comparability, and visibility of higher education.

IV. Conclusions

As a tool for collecting, selecting, organizing, reflecting upon, and presenting information, e-portfolios have gained in popularity across a variety of disciplines. Most of this popularity is due to the fact that the e-portfolio concept provides multiple advantages to the teaching and learning process. First of all, the integration of e-portfolios into the course curriculum is labeled as a step forward in developing student’s metacognitive skills. In using e-portfolios students are able to view learning as a process and to reflect upon their personal and professional growth. The e-portfolio has also become a commonly accepted tool for measuring learning outcomes, as it provides an effective means, not only for evaluation of student assignments, but for holistic assessment of academic progress.

The instructional value of e-portfolios is determined by several interrelated elements. There are a variety of purposes for creating an e-portfolio. From the standpoint of effective instruction, it is essential to identify and clearly communicate the purpose of using e-portfolios in the classroom. If the purpose of the e-portfolio is student assessment, then it is necessary to define evaluation criteria. Key components of every e-portfolio are the processes of self and peer assessment, the latter contributing to the best practice of collaboration. The opportunity for students to reflect on their own work, as well as that of their fellow students, deepens the learning process and allows the students to make connections between seemingly separate learning activities. As previously indicated, without reflection the e-portfolio is nothing more than an online storage device.

Finally, the advancement of Web 2.0 technologies provides a new and fertile ground for the further expansion of e-portfolios in the educational setting. Web 2.0 tools allow both instructors and students to design multimedia-infused, flexible, interactive, and dynamic e-portfolios. Although it may be difficult to precisely state the direction in which they will continue to flourish, it is more than evident that Web 2.0 has become the driving force behind future development and transformation of e-portfolios.

References


