

Using Digital Portfolios to Develop Non-Traditional Domains in Special Education Settings

Mary Clancy and Jessica Gardner
Cooke Center Academy

This article chronicles the development of a portfolio system used primarily to assess special education high school students on a variety of traditional and non-traditional standards and skills. Developing, capturing, sharing, and assessing student learning can be problematic when traditional testing or classroom assessment methods are not an option. Digital portfolios, when integrated correctly, provide meaningful opportunities to capture authentic student learning and assess students' growth. Additionally, digital portfolios can show evidence of student progress and allow students to participate in the assessment process, as well as facilitate opportunities for parents (and future teachers or organizations) to observe and support a child's work. We describe the development, implementation, and evaluation of a digital portfolio pilot program in a special education high school. The pilot was created in response to the need for opportunities to assess authentic student work through a variety of multimedia formats, intended to travel with students as they advance through the school system and beyond. As a result of the data and experiences, it is recommended that integrating digital portfolios into the teaching, reflection, and assessment processes when working with students with disabilities, is a way to increase opportunities for authentic assessment of traditional and non-traditional content areas, increase technology integration in classroom and community settings, and as a means to support and capture project-based learning.

A mainstay of education is to provide all students with the skills necessary to lead meaningful lives. These skills, translated into standards, are locally and nationally created learning goals for what students should know and be able to do, typically anchored to grade levels (Salvia, Ysseldyke, & Witmer, 2012). Student progress against these standards is measured through assessment, or the process of collecting data for the purpose of evaluation (Salvia et al., 2012). Assessment is a large component of educational organizations; aside from measuring student progress, it allows for communication of expected goals, provides targets for teaching and learning, and helps shape the performance of teaching and learning (Linn & Herman, 1997). Standards based testing, one method of assessment, has become the predominant practice for gathering information regarding student progress, in both general and special education. Alignment of assessment to academic content standards provides access to the general curriculum for students with significant cognitive disabilities, setting high expectations for all students (U.S. Department of Education, 2005); however, the heavy reliance on grade level content based standards testing, and omission of outcome or performance based assessments tied to criteria from a variety of domains, have led to inaccurate and incomplete assessments of student progress in special education (Browder et al., 2007).

Tracking student progress in special education often requires educators to make modifications to state achievement standards and assess students using Alternate Achievement Standards (AA-AAS; Browder & Spooner, 2011). AA-AAS offer teachers and administrators opportunities to assess students with

significant disabilities using criteria appropriate to the developmental and learning needs of individual students. For students with severe disabilities, important goals in non-traditional domains such as life skills (e.g., preparing a meal, traveling on public transportation), speech and language development (e.g., initiating a conversation), or social-emotional growth (e.g., maintaining peer relationships) are often difficult to assess. These skills, generally absent in state and national standards, are necessary for students to lead a successful and independent life after graduation (Browder & Spooner, 2011). Therefore, educators of students with disabilities must face the challenge of determining how to assess students appropriately and effectively in these critical life skill domains.

Literature Review

History of Assessment

Assessment in schools has a long political history rooted in accountability, which varies on the local and national levels. No Child Left Behind led to the design and implementation of more assessment programs in schools. There was increased accountability to the 2004 reauthorization of the Individuals with Disabilities Education Act (IDEA), which was initially created to ensure compliance with the educational right of all students with disabilities to a Free and Appropriate Public Education (FAPE; Thornton, Peltier, & Medina, 2007). IDEA required that goals and assessments for grade school children align with students' educational needs. The majority of these assessments are tests tied to grade-level reading and math content standards,

which Manasevit and Maginnis (2005) argued moved education towards a “culture of accountability of results” (p. 51). Most students with disabilities participate in these assessments, with accommodations. For the small percentage of students with disabilities unable to participate in state and district assessment systems, even with accommodations, states are permitted to use modified and/or alternative assessments (Thurlow, 2004). Specifically, a student with a disability may be tested through (a) the regular state assessment, with or without modifications; (b) an alternative assessment based on grade level standards; (c) an alternative assessment based on modified achievement standards; or, (d) in rare cases, an alternate assessment based on alternate achievement standards (Boser, 2009). The U.S. Department of Education (2003) has defined alternate assessment as,

An assessment designed for the small number of students with disabilities who are unable to participate in the regular State assessment, even with appropriate accommodations. An alternate assessment may include materials collected under several circumstances, including (1) teacher observation of the student, (2) samples of student work produced during regular classroom instruction that demonstrate mastery of specific instructional strategies in place of performance on a computer-scored multiple-choice test covering the same content and skills, or (3) standardized performance tasks produced in an “on demand” setting, such as completion of an assigned task on test day. To serve the purposes of assessment under title I, an alternate assessment must be aligned with the State’s content standards, must yield results separately in both reading/language arts and mathematics, and must be designed and implemented in a manner that supports use of the results as an indicator of [Adequate Yearly Progress]. (p. 68699)

Assessment for Students With Disabilities: The Debate

Presently, educational stakeholders are debating the effectiveness and purpose of these grade-based standard assessments for students with disabilities, with an emphasis on how modifications affect the reliability of student performance, as well as the need for an assessment system that is both outcome-based and reflective of non-standard based goals and progress (Plake, 2011). Perner (2007) not only calls into question the development, administration, scoring, and reporting of these alternative assessments but also their educational utility for improving instruction, as well as their alignment with content

standards and application to the life skills curricula. Kleinert et al. (2002) showed that there was no connection between a student’s post-school outcomes and their scores on these alternative assessments.

An assessment must be valid, reliable and usable to be considered effective, yet there is a discrepancy surrounding what is exactly an effective instrument of assessment in special education. Alternative assessments should: allow teachers to determine level of functioning at time of testing, identify specific skills acquired, inform and support program evaluation, hold teachers accountable to curriculum, and be broad and flexible to account for the diverse population of learners (Rabinowitz, Sato, Case, Benitez, & Jordan, 2008). According to Rabinowitz et al. (2008), checklists, portfolios, and performance assessments can be tailored to the needs of students with significant cognitive disabilities and provide substantively more opportunities to demonstrate learning than do traditional multiple-choice assessments. There is currently a need for more research on effective instruments of alternative assessment for special education.

Assessment goals for special education students have also been largely debated. Kleinert and Kearns (1999) questioned whether alternative assessments should focus on the content standards or a separate set of learner outcomes aligned with a functional curriculum. A functional curriculum focuses on skills required of everyday life, and enhanced participation in society as adults, taking into account a student’s individual needs and strengths (Clark, 1994). It incorporates functional academics, decision making, and problem solving, for students that have significant challenges maintaining and generalizing new skills at the same pace with similarly aged peers (Clark, 1994). Browder et al. (2003) have found that effective curricula tie functional skills to content standards. The incorporation of a functional curriculum also provides additional opportunities to assess vocational interests and aptitudes, work related social behaviors and attitudes, and self-determination competencies, which fall under the purview of transition services mandated by the 1991 IDEA reauthorization of the Education for all Handicapped Children Act of 1975 (Reschly, 2002). The ratio of functional to academic standards needed to help special education students access the general education curriculum is currently under-researched (Browder et al., 2005).

Portfolios as Forms of Assessment in School Settings

In an effort to capture student learning and progress in ways that standardized assessments cannot fully provide, many schools turn to the use of portfolios. Portfolios are used for a variety of purposes in a school setting, including formative and summative assessment (Popham, 2002; Rivera & Smith, 1997). The purposes of portfolios can vary, dependent on

teacher, student, or school organizational goals. Schools most often use portfolios to document the learning process in a growth or developmental portfolio or to show samples of student's best work in a showcase portfolio (Barrett, 2007; Gronlund, 2006). In 2005, some form of portfolio and performance based assessments was used as alternative assessments by the majority of states (Thompson, Johnstone, Thurlow, & Altman, 2005). Portfolios differ from testing in that portfolios are able to represent a wide range of material that can be individualized for students, are able to capture collaborative processes inherent in classroom instruction, and have the ability to address improvement, effort, and achievement as well as work on functional projects beyond the scope of the classroom (Popham, 2002; Wesson & King, 1996). These real-world, adaptive and functional skills based projects are often referred to as "authentic tasks" that address daily living, and are often a critical component of portfolio assessments.

Formative assessment has been defined as authentic assessment designed to "provide [teachers] with information on what students understand, where they are experiencing difficulties, and how the teaching process may need to be adjusted to overcome difficulties that have been identified" (Gillies, 2014, p. 1). In designing an assessment that can provide a glimpse into student understanding, mastery, and development, teachers are provided with real-time information to inform their planning process. Evidence of misconceptions in student understanding allows educators to further address gaps in learning in future lessons.

Schools employing project-based learning (PBL) methods have found portfolios effective in documenting development of progress, in addition to capturing goals and skills not otherwise obtained through traditional assessment means (Chang & Tseng, 2011; Gulbahar & Tinmaz, 2006). In educational settings that utilize PBL methods, students are often tasked as a learning community, with hands-on activities, such as defining problems, collecting or analyzing data, communicating with others, and publishing results (Simkins, 1999). Since portfolios allow for documentation in multimodal forms (e.g., photographs, audio clips, paper-work samples), they are useful in documenting progress in a PBL classroom (Chang & Tseng, 2011).

Digital Portfolios/ePortfolios

As the availability and integration of technology increases within schools, ePortfolios (or digital portfolios), defined as a "digitized collection of artifacts" used for a variety of purposes, have entered the assessment conversation (Lorenzo & Ittelson, 2005, p. 1). In a study of 60 eighth-grade students, Chang & Tseng (2011) set out to examine the effects of an

Internet-based portfolio on student achievement as a way to capture the outcomes as well as the process of student learning, in a classroom that utilized PBL methodology. Through analyzing work samples and questionnaires, the authors determined that using an ePortfolio system positively impacted student learning, elevating student's engagement and perception of their own learning. Thus, ePortfolios have the capacity to contribute positively to the learning and motivational process of students as well as function as a self-reflective assessment tool in curricula utilizing PBL.

Helen Barrett (2007) also studied usage and effects of ePortfolios within school settings. Together with TaskStream, an online provider of ePortfolios, Barrett (2007) researched and designed a two-year action research study in order to assess the impact of ePortfolios within K-12 settings. After analyzing over 20 schools, they concluded that ePortfolios can lead to positive collaboration among teachers and that ePortfolios have the potential to increase student self-reflection (Barrett, 2007). Further, Abrami, Venkatesh, Meyer, and Wade (2013) demonstrated that digital portfolios support self-regulated learning behaviors, such as reflection and goal-setting, and increase student learning as well as standard literacy skills.

ePortfolios have also begun to enter the assessment practices for students with special needs. As students with disabilities enter adolescence and young adulthood, they are offered transition services that highlight progress towards vocational and employment goals, as mandated by IDEA in 2004. Black (2010) proposed that Digital Transition Portfolios could be a means to teach critical self-advocacy skills for students with disabilities by fostering student motivation and engagement, offering experiences similar to that of typical peers, and by encouraging personal accountability for progress and products. ePortfolios offer multiple opportunities for students with disabilities to engage meaningfully with their own work, as well as self-reflect and assess.

ePortfolios for students with special needs have also been shown to shift the message from "assessment of student work to evidence of student strengths, interests, skills, and goals" (Glor-Schieb & Telthorster, 2006, p. 3). By engaging in this shift, ePortfolios have the ability to give students with disabilities a voice in their own transition planning, Individualized Education Plans (IEPs), or parent conferences. Glor-Shieb and Telthorster (2006) suggested multiple venues for students with disabilities to participate in ePortfolio work, including as an IEP preparation tool, communication devices, and culminating projects for graduation purposes.

Digital Portfolio Program Development

Digital portfolios were piloted in a small private special education school that serves students, ages 14-21 in an

urban area, with moderate to severe disabilities. Student diagnoses include autism, speech and language impairment, intellectual disability, learning disability, and/or physical disability. All students qualify for special education services from the New York State Department of Education and have Individualized Education Programs mandating small, self-contained classes. The existing curricula aim to provide students with a developmentally appropriate, multisensory curriculum to support academic development, social-emotional functioning, and vocational training in order to maximize independence in the school, home, and local community. Prior to the 2012-2013 school year, traditional paper portfolios were used to collect work samples of student work as evidence of goals assessed in the progress report. Portfolios were updated on a trimester basis by academic teachers and included classroom work samples and informal assessment results. Portfolios for each student were passed on to subsequent teachers in order to create a cumulative record of student work. After graduation, a student's paper portfolio was kept on site for five years.

Motivation

A committee of school faculty was selected during the 2012-2013 school year to assess the utility of the paper portfolios. At this time, it was determined that the ePortfolios presented a number of challenges: (a) content area teachers did not feel that paper work samples were the most effective evidence of student progress due to the multisensory nature of the curriculum; (b) clinicians felt that student progress made in the community and other non-traditional classroom settings (e.g., social settings) was not accurately captured within paper portfolios; (c) storage of the paper portfolios was presenting an issue due to limited space and storage options; (d) after four years of collection of work, portfolios were often large and disorganized; (e) administrators questioned the utility of students being able to use the portfolio as a future resource to outside agencies or organizations as evidence of strength/growth; and (f) with the increase in technology integration within classrooms and the school community, all faculty questioned whether paper portfolios were the most effective way to capture the current learning environment.

In the 2013-2014 school year, a small pilot group of teachers and clinicians were selected to trial a move towards digital portfolios at the high school. The goals of the pilot were identified:

- provide opportunities for the collection of authentic student work in an electronic format;
- allow for additional methods of assessing authentic student work;
- increase student participation in the assessment process;
- increase multimedia representation of student progress (e.g., video documentation);

- produce student and parent-friendly work samples that could travel with students across time.

Implementation

Software and Program Selection

After determining the goals of the pilot, the pilot team discussed feedback from the technology specialist, the division head, and content area teachers about staff and student use of technology. Based on this feedback, a set of criteria the chosen platform and program should satisfy was developed:

- is easy for staff, students, and parents to learn and use;
- offers extensive privacy controls;
- easy to use on the back-end;
- company open to communication and incorporating school feedback into future updates;
- allows students to take ownership of projects;
- allows students to take work with them when they graduate;
- allows students to share work outside of the school community; and
- provides access to training and professional development, as well as technical support.

After trialing a variety of programs, software was selected based on a determination by the school committee.

Phase One

Prior to beginning the pilot, a discussion of technical support structures and equipment needed took place. This was a critical step in the beginning stages of the ePortfolio process; available resources would shape the integration plan. Further, there are different digital portfolio programs available for different platforms; it was necessary to know what programs were compatible with the devices currently being used. Available equipment was inventoried and analyzed, including classroom and shared resources (Table 1). Then, the digital format that the work would take was noted: pictures, videos, Google Docs, slides and drawings, Microsoft Word documents, PowerPoint slides, and PDF scans. It was determined that there would be an increased demand for video-making equipment such as iPads, as well as actual computers for students to use to manipulate and upload work. Devices that would support capturing, editing, and uploading work would be preferable, and thus staff and student access to iPads was prioritized. In addition, a classroom set of 14 Apple MacBooks to be shared by all staff was added, as well as a permanent MacBook station, consisting of five devices, in one of the classrooms. In addition, the pilot team created a long-range

Table 1
Devices Figures per Year of Program

	Student Macbooks	Student iPads
Year 1	0	12
Year 2	14	24
Year 3	19	25

Table 2
Student-Centered Technological Device Classroom Use

	Year 2		Year 3	
	Periods in Use	Total Periods	Periods in Use	Total Periods
MacBooks	100	154	121	154
iPads	83	147	64	133

Note. Data taken from a representative sample, March of 2015 and March of 2016.

plan to begin replacing staff computers with ones capable of handling multimedia editing.

The first year, digital portfolios were piloted by three staff members spread across three content areas, to provide a wide scope of projects typical to the school. The Technology teacher, a Humanities teacher, and a Vocational Skills teacher used digital portfolios with all of their classes, which encompassed every student. Prior to launching digital portfolios, these staff members received over 225 minutes of professional development, in individual sessions, on the specific programs that they would be using, and in assessment planning/unit design. Throughout the first year, staff received ongoing support and training through push-in support by the Technology Specialist, as well as through digital guides and handouts. Starting the pilot with a controlled group of staff not only provided administration and the pilot team with feedback regarding necessary support and training before going full scale, but also created a staff-led digital portfolio team of experts who later served as a valuable resource for other staff members the following years. Due to the teacher-centric goals of the first phase, which focused on building faculty experience and proficiency, access to projects was not shared with parents.

Phase Two

In the second year, the digital portfolio program was launched with the whole school. All staff members were required to upload two projects per student each trimester. All staff members were given 105 minutes of small-group training by the department in the summer prior to the start of school, on the specific programs they would be using, assessment planning/unit design, as well as analysis of example projects from the first year. Staff received ongoing training through demo lessons, small group instructions, and digital guides. During this phase, students also received specific training on how to use the program

in their Technology classes throughout the year. Available hardware was also increased; available student devices were nearly tripled between the first and second years, and then increased an additional 15% between the second and third years (Table 1). It was also determined that staff would need increased access to technical support individually and when working with students on portfolio projects. All classes were given a weekly period in the technology lab with the Technology Specialist for portfolio specific work. In addition, the Technology Specialist attended monthly staff department meetings to discuss technical issues related to digital portfolios. In the second year, after faculty demonstrated proficiency developing high quality projects and using the program, parents were given limited access to final projects. Student and parent attitudes towards digital portfolios were noted as positive, through observation by classroom teachers and administration. Parents commented on the ease and availability of accessing student work and the opportunity to share within their respective communities. Students enjoyed having a larger audience in which to share work, both within and outside the school community.

Phase Three

In the third year, the digital portfolio program was expanded to parents, as well as the post high school program, which aims to facilitate transition to life after high school through specific life skills courses, vocational training, academic experiences, and paid internships. Parents received access in a tiered roll out. They were shown the program and their child's work by each teacher during the trimester through parent-teacher conferences. Following the conferences, parents were enrolled in the parent portal of the site by the Technology Specialist, and contacted with their specific access

Table 3
Projects and High Quality Projects by Year

	Year 2		Year 3	
	Published projects	High quality projects	Published projects	High quality projects
Math/science	107	71	79	57
English language arts/social studies	80	35	62	39
Related services	24	0	69	49

Note. High quality projects are defined as having a rubric aligned to report card goals as well as student reflections.

codes. By the end of this study, 74.47% of parents were enrolled and active (having logged in and interacted with at least one project in a given time frame) with the digital portfolios. In the third year, staff training was structured around improving projects and using projects as part of the assessment process. Additionally in the third year, staff were asked to reflect and offer feedback on the portfolio process for the school as a whole, as well as their specific projects.

Analysis and Recommendations

As schools that serve students with disabilities continue to develop effective assessment tools, ePortfolios must not be overlooked as a tool to capture vocational goals, functional curricula, student strengths, and interests. Based on observations and interviews from administration, staff and parents, and observation and evaluation of student work by staff and administration, the digital portfolio pilot has been the most successful in terms of increasing student reflection, increasing communication and collaboration between staff and with parents, aligning unit projects to student goals, and creating increased opportunities for project-based learning. Additionally, we saw an increased daily use of student-centered technological devices in the classrooms, which is a marker of project-based learning (Table 2).

In addition to the benefits for project-based learning, digital portfolios allowed for the capture of students skills and progress to be used for assessment, especially in non-academic domains (e.g., life skills). Prior to the digital portfolio pilot, evidence of related service work samples (defined as speech and language therapy, counseling, occupational therapy, adaptive skills, and vocational skills) were not available, and the school had limited opportunities for students, teachers, or parents to engage with student work in these domains. At this phase of the three-year process, related service portfolios consist of 34% of portfolio entries school wide (Table 3). Given the unique needs of the student population, another outcome of digital portfolios is an increased opportunity for related service professionals to assess student development in these domains. Furthermore,

related service digital portfolios created tangible evidence of non-academic (e.g., work-place skills) for students to take with them after graduation.

High quality portfolios were defined as project entries that aligned with progress report goals and incorporated student reflection. At this phase of the process, high quality portfolios consist of 69% of all entries, as compared to 38% in the second year (Table 3). The paper portfolios used prior to the start of the digital portfolio pilot program would not fall under the definition of high quality portfolios, lacking both report card aligned rubrics as well as consistent student reflections. The decrease in quantity and increase in quality of portfolio project entries between the second and third years of the program is likely attributable to the increase and shift in professional development, focusing more on self-reflection, unit planning, project design, and integration of technology into the lesson, instead of technological program basics. This had the added effect of making the teaching and lessons themselves more engaging and interactive, as evidenced by staff and student feedback and observations from the administrative team. In addition, further training on types of portfolio projects was provided, differentiating between growth, showcase, and assessment portfolios. During this training, examples of each type of portfolio, as well as what should be excluded from a portfolio piece, were included. Each department met with an administrator and the Technology Specialist to develop personalized goals for respective departments that supported the development of high quality portfolio entries. This additional training was necessary to clarify expectations, and in the case of many clinicians without formal teacher training, to clarify ideas surrounding unit, goal, and assessment planning. We recommend providing training before starting a digital portfolio project, not only on the platform chosen, but also on what an appropriate portfolio piece is, the purpose of portfolios in general, unit planning and the assessment process.

Technical support, for students and staff, was also a critical factor in the pilot's success. Initial resistance from staff was mainly centered on the additional time required to digitize work being done in different forms. After the first year, it was determined that much of the extra time came from uploading student work. To

address this, students were trained on how to use the website and upload work independently and directly from multiple devices. Students received this training and practice in their Technology classes; staff were not required to do this additional task. All staff members were also assigned one day a month in the technology lab, with the support of the Technology Specialist. During this time, they could bring their classes to upload work. While this was better than no designated time, the pilot team found that in the second year, this time was more productive and successful if it was flexible, meaning the Technology Specialist could push into a class as they finished a project. We recommend having a flexible and ongoing support system integrated into the classroom.

From a program perspective, several administrative shifts needed to occur in order to successfully implement the ePortfolio pilot. Dedicated time for staff development, small group trainings, and regular meetings were necessary to establish throughout all phases of the implementation. ePortfolios were prioritized within all departments and professional development time and funding was prioritized over the course of the process. Supervision meetings and annual reviews frequently highlighted ePortfolio processes and products as systems became integrated into the culture of the school community. To integrate ePortfolios effectively as both an instructional and assessment tool, we recommend dedicated professional development time, funding, and integrating manageable goals into the annual program plans for each school year.

Overall, we recommend a shift toward ePortfolios as a means of increasing technology integration within special education learning environments and as an assessment tool for traditional and non-traditional content areas in the areas of special education. In using ePortfolios, we have been able to assess student development more fully and accurately in content areas both in the classroom and in the community, provide students with increased opportunities to engage in the learning process, provide parents and organizations with a lens into a student's current functioning levels, and provide an effective structure for incorporating multimedia work into student work portfolios. As we continue to seek ways to improve the quality of education and assessment for our students, ePortfolios remain on the forefront of tools poised to support such goals.

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MARY CLANCY is the Division Head of Cooke Center Academy, a school for students with moderate and severe disabilities in New York City. She is also an adjunct professor in the Department of Teaching and Learning at New York University. Her primary interests include improving educational opportunities for students with disabilities, including the use of technology and ePortfolios as tools in instruction, assessment, and communication.

JESSICA GARDNER is the Technology Specialist for Cooke Center Academy, a school for students with moderate and severe disabilities in New York City. Previous to working at Cooke Center, she worked as a special education teacher at a public middle school in the Bronx, NY. Her primary interests include giving students the tools they need to succeed in school, work and in the community, as well as improving the meaningful integration of technology into curriculum.