INNOVATION IN EDUCATION THROUGH HOLISTIC ASSESSMENT

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ABSTRACT

This paper reports on an effort to expand assessment to include a holistic view of student learning that can be leveraged by academic institutions, students, and external stakeholders. Current assessment processes leverage century's old technology to collect and examine a thimble full of data. Collecting more data from a wider pool of sources will provide a richer view of learning assessment. Also, automation will increase data velocity and enhance ideation at the faculty, department, college, and university levels and offer insights to students as they navigate and demonstrate their education accomplishments. Holistic assessment will inform and empower innovation in education.

Keywords: Assessment, Education, cocurricular, extracurricular

INTRODUCTION

The purpose of this paper is to propose innovation in education using holistic assessment. Education is moving from the industrial age to the digital age with an assessment process that is firmly rooted in the stone age. Assessment has become increasingly important in higher education as external demands for increased accountability, competition in the marketplace, and learner demands, increase [1]. External demands come primarily in the form of government oversight and accountability [2] as well as the stakeholder community. There are also demands for change due to increases in adult learners and changes to attitudes regarding value propositions and learner-centered experiences among Gen Z students [3].

External pressure, market forces and learner demands are sufficient reasons for choosing to innovate when it comes to assessment. But technology offers more reasons to consider an investment in assessment processes. The tasks involved in collecting, processing and tabulating assessment data has long been burdensome and undesirable for those working in higher education, as well as an expensive and time-consuming process for educators and education organizations. Digital innovation: however, offers capabilities that can collect, process, and tabulate much larger quantities of data while dramatically reducing demands on human capital within higher education. Furthermore, ideation on education innovation is dramatically slowed by the glacial pace of assessment processes and the time to deliver results. Today's assessment is built on too little data and is too slow to meaningfully support innovation in education.

Students could potentially tap into a digital record of their academic experiences that includes the experiences they brought with them into the institution such as transcripts from previous institutions and credit for prior learning. Research has demonstrated both the technical proficiency and desire for technical supports and challenges within their education [4]. The digital record would also track the many experiences from within the institution starting with their coursework and including co-curricular and extracurricular activities that provide rich and compelling insights into a potential job candidate that

far exceed the value of a traditional transcript. An overhaul of assessment processes within higher education is a win-win-win as it offers the potential for enhanced feedback to faculty and other campus stakeholders on performance, increased accountability and services to students and external stakeholders while reducing costs.

INNOVATIVE TEACHING

A challenge when considering assessment is the need to define what is being assessed. Articles speak of assessing learning, attitudes, teaching, teachers and more. Assessment outcomes between the various areas are sometimes conflated thus confounding outcomes. The broad use of the term assessment without clearly stating the definition of assessment in context and even the transitions from one use of the word assessment to another within a single manuscript can create confusion. This issue is displayed in abstract from Enstrom and Schmaltz in the 2019 WDSI proceedings in which they critique innovative teaching as not tested and even proven ineffective [5]. The authors do not cite the papers or materials they are critiquing but misconceptions about the value of a particular activity or outcome depends on the measurement and the context. The term holistic assessment is defined in the following sections along with the context for its use.

ASSESSMENT

In this paper the object of holistic assessment is learning, and the definition of learning must be defined, so what is learning? While most academics would likely provide a fine answer to this question, it still warrants discussion as a conversation on assessment is reliant on a solid agreement as to the definition of learning. A search of the Merriam Webster dictionary for the word *learning* [6] yielded the following definitions:

1. the act or experience of one that learns
2. knowledge or skill acquired by instruction or study
3. modification of a behavioral tendency by experience (such as exposure to conditioning)

The three responses from Merriam Webster's dictionary yields the terms knowledge, skill, and experience as basic elements to define learning. Furthermore, a search of the Merriam Webster dictionary for the word *experience* [7] yielded the following definitions:

1. the process of doing and seeing things and of having things happen to you
2. skill or knowledge that you get by doing something
3. the length of time that you have spent doing something (such as a particular job)

The definition of experience boils down to the knowledge and skills gleaned from engaging in activities, which reduces learning to knowledge and skills obtained through engaging in activities. With a simplified version of learning in hand, an examination of the word *assessment* is warranted. A search of the Merriam Webster dictionary for the word *assessment* [8] yielded the following definitions:

1. the action or an instance of making a judgment about something: the act of assessing something: APPRAISAL
2. the amount assessed: an amount that a person is officially required to pay, especially as a tax

Ignoring the second definition of assessment as it does not apply in this context, we now have a definition of assessment that will be used within this paper. For this paper, assessment is defined as a judgement about knowledge and skills gleaned from engaging in activities. The term holistic assessment will be covered in the next section.

HOLISM

The term holistic assessment is used in this paper to knit together the many parts of assessment that are needed to form an accurate picture of students' learning. This term has been used in K12 education and the medical field for decades with the notion of gathering data from multiple sources to inform an assessment process. The term holism is credited to Jan Smuts book Holism and Evolution [9] and expresses the notion that various systems should be viewed as wholes, not simply a collection of parts. This paper makes the same argument in terms of assessment. A student's learning history should be knitted together into a whole that includes everything they brought into the institution as well as everything earned within the institution including curricular, cocurricular and extracurricular assessments.

Credit for prior learning, transcripts from previous institutions, coursework completed within the institution, cocurricular, and extracurricular work should all be covered. Placing all the data into a whole digital record improves the ability for an institution to serve students individually and corporately. A single holistic assessment record also offers opportunities for enhanced insights for improving institutional processes and faculty performance. And finally, a single holistic assessment record offers opportunities for institutions to report to stakeholders in a transparent manner and for students to allow entities (such as potential employers) to gain deeper insight into their learning performance.

Finally, the definition of holistic assessment for this paper is a judgement about the complete record of knowledge and skills gleaned from engaging in activities.

COMPONENTS OF HOLISTIC ASSESSMENT

As mentioned earlier, the components of the holistic assessment espoused by this paper are credit for prior learning, transfer credit, curriculum within an institution, cocurricular activities and extracurricular activities. While the assessment of transfer credit and curriculum within the institution are well engrained in academic organizations, the others are perhaps less familiar.

Credit for Prior Learning (CPL) Assessment

The California Community College policy implementation handbook defined credit for prior learning as "credit awarded for validated college-level skills and knowledge gained outside of a college classroom." [10]. The CPL policy handbook goes on to cite a number of important facts drawn from research that show students who earn CPL are more likely to complete their degree, take less time to complete their degree and actually earn more credit through coursework then their non-CPL-earning counterparts. Even institutions that do not explicitly accept CPL do so through transfer within the United States as each of the branches of the United States Military map CPL to transfer credits which all colleges and universities in the United States must accept.

Transfer and Course Assessment

As mentioned earlier, all higher education schools in the United States accept some forms of CPL through accreditation organizations such as ACE that translate learning in the military to credits that schools accept through transfer. Most transfer credit: however, is awarded through articulation for work completed at another college. Course assessment is not discussed in this paper as it is well established and is not the focus of the activities with this project.

Cocurricular Assessment

Cocurricular learning in many institutions is viewed as stemming from extracurricular learning that formalizes and matures to the point that it is accepted in the curriculum and granted credit. In the author's experience this same trend has been seen and is highly valued. A second source of cocurricular content comes from former classes that were dropped but there are still faculty and students interested in pursuing knowledge and skills in the area, so the topic lives on through student clubs and faculty seminars outside of the classroom. In either case, there is a great deal of value in embracing this learning as its very existence is testament to the support that students and faculty invested to keep the learning going.

Cocurricular learning in some cases can still be awarded course credit and in a few instances can be used to fulfill elective credit. The author argues that there is value in assessing cocurricular assessment even if course credit will not be provided as it represents valuable knowledge and skills that students may want or need to demonstrate to others at some point. In addition to student benefits based on the ability to demonstrate the learning, there is also the fact that student involvement in activities beyond the curriculum is a valuable measure of engagement that leads to increased retention and higher rates of graduation. Finally, cocurricular activity is an excellent indicator of student interest and can inform potential changes to curriculum. If the cost of collecting and processing assessment data is brought to near zero, then the benefits of collecting and disseminating cocurricular assessment data is a wise investment.

Extracurricular Assessment

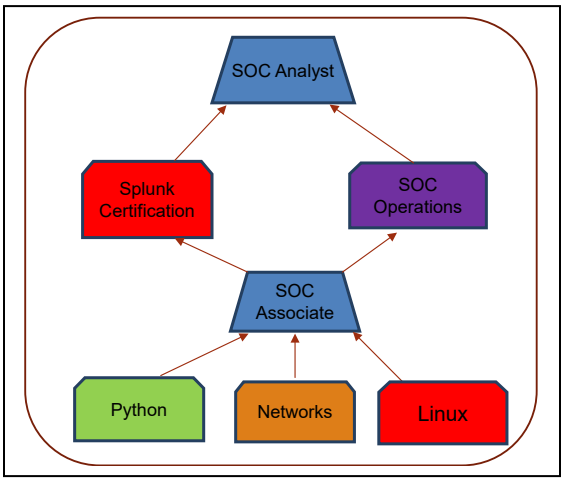
Extracurricular learning differs from cocurricular learning in the environment in which the author teaches as it is student led and managed. Students form clubs around mutual interests and then operate services or events that are beneficial to club members. Services include peer mentoring/tutoring and events include workshops on topics such as Python programming which was not available in the curriculum.

So far there has been no assessment of extracurricular learning at the authors institution as assessment is difficult and costly and therefore reserved for formal coursework. However, extracurricular learning represents some of the more engaging experiences on campus. Employers routinely seek information student involvement in extracurricular activity on campus as it is considered an important input in the hiring process. Sadly, the university does not collect, assemble and disseminate this information leaving students on their own to collect and provide information and employers to their own to validate and understand the meaning of the data provided.

OUTCOMES FROM HOLISTIC LEARNING

Figures 1 below shows student-focused activities that are an excellent example of opportunities made possible through the mix of curricular, cocurricular and extracurricular learning drawn from Pike et al.

[11] The activity in Figure 1 is a pathway for students to reach the designation SOC (Security Operations Center) Associate and then ultimately SOC Analyst in preparation for careers in cybersecurity. Figure 2 demonstrates the two tools currently in consideration and pilot testing to collect and disseminate extracurricular learning.



Benefits of E-Portfolio and Digital Badging

E-Portfolio	Digital Badge
Self-reflection	Extrinsic motivation
Storytelling	Illuminate learning pathways
Linking theory to practice	Market to employers or higher-level education

Figures 1 and 2

The program did not yet have a Python course, but a faculty member was providing a cocurricular offering of Python due to industry demand and student interest. The networks course was a course in the curriculum and the Linux course was offered as an extracurricular series of workshops through a student club. With these three learning achievements in hand, a student could start in the university's SOC as an associate and start processing cybersecurity events within a SIEM system.

Once a student completed a certification offered through corporate partner and managed as an extracurricular activity through a student club, along with completing one hundred hours of service processing cybersecurity events in a SIEM system, the student earned a badge as a SOC Analyst. A pathway to creating a SOC Analyst training badge was made possible through contributions from curricular, cocurricular and extracurricular contributions.

CONCLUSION

This paper argues for holistic assessment first because of a perceived need to diversity the inputs and increase the quantity, quality and velocity of data collection as well as the velocity of, processing data and making outcomes available. Assessment needs to be re-envisioned as a process with many more inputs that are collected digitally and strategically and then processed using automation and data science algorithms. This change will provide the ability to draw in many more data sources, greater volumes of data and improved analysis and rapid outputs. Innovation in education requires improved data to measure and manage change which requires holistic assessment.

A failure to embrace change in assessment means that a small sample of data will continue to be collected twice per year. This data will be slowly and painstakingly processed with fall results being available in April and spring results available in July. Academics then have a couple weeks to consider this data, select a couple of items to change for the coming year and then try one item in the fall and one in the spring. This process does not facilitate the experimentation and ideation needed for innovation in education. This process also does not facilitate needs of students, employers, external stakeholders, and

others mentioned earlier in the paper who would benefit from a more rich and timely understanding of learning within the university.

REFERENCES

[1] S. Bevitt, Assessment innovation and student experience: a new assessment challenge and call for a multi-perspective approach to assessment research., vol. 40, no. 1. 2015, p. 119. [Online]. Available: http://proxy.library.cpp.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,uid&db=aph&AN=99907667&site=ehost-live&scope=site

[2] M. Goos and C. Hughes, "An investigation of the confidence levels of course/subject coordinators in undertaking aspects of their assessment responsibilities.," Assess. Eval. High. Educ., vol. 35, no. 3, pp. 315–324, May 2010.

[3] C. Seemiller and M. Grace, Gen Z Goes to College. San Francisco, CA: Jossy Bass, 2016.

[4] N. Buzzetto-Hollywood and A. Alade, "AN EXAMINATION OF GEN Z LEARNERS ATTENDING A MINORITY UNIVERSITY.," Interdiscip. J. E-Learn. Learn. Objects, vol. 14, pp. 41–53, Jan. 2018.

[5] R. Enstrom and R. Schmaltz, "How Fine is Innovative Teaching? Fads and Fallacies of 'Cutting Edge' Instruction," presented at the 47th Annual Meeting of Western Decision Sciences Institute: WDSI, 2019.

[6] "Learning | Definition of Learning by Merriam-Webster." https://www.merriam-webster.com/dictionary/learning (accessed Oct. 13, 2021).

[7] "Experience | Definition of Experience by Merriam-Webster." https://www.merriam-webster.com/dictionary/experience (accessed Oct. 13, 2021).

[8] "Assessment | Definition of Assessment by Merriam-Webster." https://www.merriam-webster.com/dictionary/assessment (accessed Oct. 13, 2021).

[9] J. C. Smuts, Holism and evolution, Rev ed. Oxford: Macmillan, 1936. [Online]. Available: http://proxy.library.cpp.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,uid&db=psyh&AN=1937-02380-000&site=ehost-live&scope=site

[10] "Credit for Prior Learning Policy Implementation Toolkit." California Community Colleges, 2020.

[11] R. Pike, T. West, A. Zentner, and B. Brown, "Digital Badges and E-Portfolios in Cybersecurity Education," Inf. Syst. Educ. J., vol. 18, no. 5, pp. 16–24, 2020.