Evaluating Assessment Management Systems: Using Evidence from Practice

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Abstract

One focus of the Vision Project, a Commonwealth of Massachusetts initiative begun in 2009, is to encourage growth in public colleges and universities' learning outcomes assessment efforts. Related to that focus, in 2012 a state-level Assessment Management System (AMS) Committee was formed. Charged with investigating issues related to possible use of electronic systems for centralized collecting and scoring of student products, the Committee conducted a survey of campuses which yielded basic data on campus AMS use. In this report, we present the results of an independent investigation designed to obtain more in-depth information to inform our local decisions concerning AMSs, and to possibly be useful to the on-going state level efforts.

In interviews, representatives of 15 Massachusetts colleges and universities reported a long list of concerns and barriers, both technical and human, to electronic systems' implementation – whether or not they were currently using an AMS. The results of this research suggest the importance of campuses carefully evaluating its outcomes assessment process needs, whether an AMS system will meet those needs, and if so, whether the institution will be able to provide the resources needed for full and effective implementation.

Key words: Assessment data management, costs of technology, technology adoption

Introduction: The Massachusetts Vision Project and AMCOA

The Vision Project is a Commonwealth of Massachusetts initiative, begun in 2009, with one major focus being to provide support for and encourage growth in learning outcomes assessment efforts within and across the public colleges and universities in the state system (http://www.mass.edu/visionproject/). Related to that focus, in 2011, the state Department of Higher Education formed the Advancing a Massachusetts Culture of Assessment (AMCOA) team, which in academic year 2012-13 was comprised of faculty, administrators, and assessment directors from 15 community colleges, 8 state universities, and 4 University of Massachusetts campuses.

One major goal of the Vision Project is to develop and implement a process for cross-campus learning outcomes assessment, which would allow for measurement and comparison of student learning based on authentic student work rather than standardized exams or grades. This process

would involve the regular state-level collection and scoring of authentic student work from state colleges and universities. In order for this work of collecting and scoring student products from multiple campuses across a wide geographic area to be possible and feasible, many issues needed to be addressed, including the selection of evaluation tools and the development of methods for collecting, scoring, aggregating, and reporting data.

The first issue was addressed with the identification of the American Association of Colleges and Universities (AAC&U's) LEAP (Liberal Education and America's Promise) VALUE (Valid Assessment of Learning in Undergraduate Education) rubrics as possible assessment tools, which could be used across campuses and then at the state level to assess student products (http://www.aacu.org/value/rubrics/index_p.cfm?CFID=45080145&CFTOKEN=81886026). AMCOA members and others from various campuses were introduced to and trained in the application of many of these rubrics through meetings, workshops, and AMCOA conference presentations.

With respect to the second issue, a system supporting electronic submission of products from campuses for centralized scoring and analyses appears to be needed. In academic year 2012-13, the AMCOA Assessment Management System (AMS) Committee was formed and charged with the responsibility to investigate the current status of state campuses with respect to electronic assessment systems, and to make recommendations for a state level system. Rather than collecting information from vendors of commercial systems, the AMS Committee elected to reach out to the campuses by means of a survey, to collect information concerning systems in place or under consideration. The goal was to identity benefits found, problems encountered, resources needed, and the type of preparation that might be needed by faculty and students to ensure successful state-wide implementation. In this way, best practices could be identified, and any recommendations made to the state, which has already invested significant resources in this assessment work, would have the support of additional practice -based evidence.

The spring 2013 AMS survey yielded basic information, but after review, we determined that more data were needed to obtain a clearer picture of the current status of campuses with respect to learning outcomes assessment processes in general, and the use of electronic tools for assessment in particular. Although the status of AMCOA was at that time uncertain, we thought that additional investigation could yield information useful to the still-planned state level assessment efforts. Our major goal, however, was to conduct a more in-depth examination of practices in other state institutions to obtain evidence that would inform our local decisions related to introducing and implementing an AMS.

Definitions

Within this report:

- **Assessment** refers to those activities and processes designed to evaluate student products with respect to the students' achievement of defined learning outcomes.
- **E-portfolio** is defined because of some confusion between this term and an AMS. At its simplest level, an e-portfolio is a repository of an individual student's artifacts, which can be customized by the student, added to, and retained over time. The main purpose is collection.
- **Assessment Management System** (AMS) is "…essentially an 'electronic system or structure' that enables institutions to collect, manage, and report data related to student learning outcomes assessment" (Oakleaf, Belanger, and Graham, 2013). Beyond a basic

repository, an AMS allows the inclusion of structures or templates such as rubrics which facilitate the assessment of student work as well as functioning as a database with features for aggregating and reporting of assessment results across students. Further, an AMS potentially allows for the inclusion of data from other sources.

- **Program** is used to refer to the academic unit below the institutional level, and could represent, depending on the institution, the "major", academic program, or department.

Method

Towards the goal of deeper inquiry and obtaining evidence from practice, we developed a detailed semi-structured interview, and queried administrators and faculty who were involved with learning outcomes assessment work at 15 state community colleges and universities. The institutions were selected based on information obtained from the initial AMS Committee survey, respondent availability, geographical and segmental representation, and to some extent on convenience. The institutions were drawn proportionately from the three sectors of the Massachusetts public higher education system. The undergraduate enrollments of the selected institutions ranged from 1000 to 12000 with a median of approximately 5400, slightly smaller than the median enrollment for all institutions (7100).

Our interview was framed around responses to basic questions concerning whether the assessment processes at the institution were supported by an electronic system. Within each categorization – supported or not supported - the questions were somewhat customized to form a holistic grouping within which to discuss campus work.

The questions were developed with the intention to obtain detailed descriptive information about an institution's learning outcomes assessment, including levels of assessment – e.g. program and/or institution-wide – the processes involved in the collection and evaluation of student work, whether portfolios are used, resources required, costs and benefits, and the extent to which the process is meeting the institution's needs. Institutions that were using an electronic system were asked a series of additional questions, including regarding the system bring used and the decision making behind the choice of a system. If electronic systems were not in use for learning outcomes assessment, questions about any future consideration or plans were added.

The often very different approaches taken by the various institutions, and an associated difference in the salience and relevance of certain question areas, in some ways affected the direction of the interview. This resulted in certain variations in the type and depth of topic coverage from campus to campus.

The interview and respondent recruitment processes were approved by the Westfield State University Institutional Review Board. In the interview confirmation letter, all respondents were assured of the confidentiality of their responses.

Results

Our initial inquiries focused on determining whether outcomes assessment work was being conducted, and if so, at what levels. We found that, in general, campuses are assessing learning outcomes at both the program and institutional levels, although in most cases, there are gaps. Rarely was every program on a campus engaged in student learning outcome assessment. At the institutional level, with one exception, not all campus-level outcomes are being assessed. Writing is the competency most frequently reported as being the focus of institution-wide efforts, with quantitative reasoning and critical thinking sometimes addressed.

Six of the 15 institutions are using an AMS for learning outcomes assessment, but this use may be limited, for example, to certain specific programs. Information on these campuses and their products will be discussed below under **Campuses with Learning Outcomes Assessment Supported by Electronic Systems.** Five others have electronic systems on campus, mainly e-portfolios, with several planning to move in the direction of using these systems for outcomes assessment. These institutions will be discussed under **Campuses with Learning Outcomes Assessment Not Supported by Electronic Systems.**

While our main focus was on obtaining information about AMSs, and evaluating evidence provided from campuses using such systems, we still thought it informative to query campuses not using such systems concerning the assessment processes in place. Further, it would be useful to determine whether systems have been used and abandoned in the past, and for what reasons, or are now being contemplated, and again for what reasons. Information about factors prompting consideration of use and possible barriers to implementation and use could also be explored.

Campuses with Learning Outcomes Assessment Supported by Electronic Systems

Systems in Use

Six campuses reported AMS use, involving four different commercial software packages. There is currently no standard program dictated by the state, although one is currently being pilot tested with state support across six campuses. When combined with the software being used by non-AMS campuses for e-portfolios, there are five unique software packages in use across the nine campuses using some electronic data collection or management system. In addition, some programs within a campus have developed their own specialized systems or adopted commercially available products tailored to the specific program. No campus reported the use of a locally developed system.

The earliest adopters of dedicated AMSs selected these systems around 2005. A recent wave of adoptions led to the selection of additional systems. Observations by respondents at two campuses indicated that there is a belief that the availability and capability of software in this field is still evolving, and that even over the past few years, systems have changed. If made today, based on these developments and institutional experiences, the decisions as to which system to use might be quite different.

Description of processes: Collection and Assessment of Student Work - Reporting of Assessment Data

Processes for institutional assessment vary across campuses, as does the extent to which the campus AMS is used to support the process. On some campuses, student work is collected from faculty teaching courses, either hard copy or electronic, and then uploaded to the AMS for electronic rubric scoring by faculty. Two respondents reported even less faculty interaction with the AMS. On those campuses, most faculty scored student work on paper and submitted rubric scores on paper for entry into the database. Other institutions make greater use of the software's capacity by having students submit work to the system, for example via an e-portfolio, for later faculty assessment. Several respondents reported that e-portfolios are also used in specific programs, especially teacher education programs and writing programs, or individual courses, such as capstone courses.

There appears to be no uniformity in what or how data are reported out. Data reported from the AMS range from system-generated aggregated data summaries to reports of results to individual

students, allowing the student work to be used for formative as well as summative assessment. At one institution the respondent noted that faculty were able to obtain immediate reports of assessment results and use them to modify instruction.

Level of User Support for AMS Use

While not universal, faculty support for AMS use is reported as being low, as reflected in variable faculty compliance with e-portfolio use in the absence of a requirement, and in various expressed concerns including the burden on faculty time, the need for additional and continuing training and the resources to support this, and the additional cost to students. We received little information on students' views of AMS use, primarily because the systems were only recently adopted and there is so little student interaction with them.

Resources used

The direct cost of the AMS to the institution depends upon the AMS selected and the payment model: student fees or institutional license purchase. In all cases, respondents reported that the indirect cost to the institution is significant. Even after an initial implementation period which, according to one respondent, required the efforts of four staff members, all systems require some ongoing administrative support and training for students. Generally, departments using the system extensively have dedicated support personnel. Other institutions use campus academic support or technical support centers to provide training.

Decision to use AMS

We were interested in how the decision to use an AMS was made, including the needs identified which led to this decision and the reasons behind the selection of the specific software system chosen. In most cases, the initial need for AMS or e-portfolio software was driven by either institutional or program accreditation. Improving students' writing skills through formative and summative assessment was the other reason given for use of e-portfolio software and its associated AMS. Features such as cost, ease of use, portability for students for later use, and compatibility with campus learning management systems were other factors that entered into decision making for adoption or expansion beyond individual programs. The selection process is usually a group decision by staff and faculty, and is based on vendor presentations and pilot testing.

One campus reported institutional-level pilot testing, while other reports indicate more of a program-by-program adoption. The overall goal of that latter approach appears to be that some programs will serve as "early adopters", and from there the use will spread. After years of little spread across the campus, however, there was an observation made by the campus representative that although the "grassroots" approach is probably best, it is not the fastest!

AMSs typically include a variety of features, from e-portfolio construction and assessment to survey delivery, which are used selectively by programs and institutions.

Barriers to Implementation and Use

The barriers to use of AMS are both technical and human. The technical issues include lack of integration between the learning management system in use on campus and the AMS, constraints inherent in the structure of portfolios determined by the particular AMS, and lack of anonymity of student work submitted through the AMS when it is needed. This first and last of these issues will impact any state-wide use of student artifacts from an AMS. Financial support for training

students and faculty is an on-going issue, as is the time required to train students. Faculty are concerned about the extra work required to access the system and the extra expense for students. Further, there is the issue of faculty buy-in, which is necessary for any systematic use of an AMS. Many readers/assessors prefer to read/grade paper products. Some faculty and students don't see the value in uploading documents to the e-portfolio, which has implications for the quality of material that is uploaded. For small institutions, the time spent to set up an electronic system may not be balanced by time saved through the use of technology. There is a concern that some features of a campus AMS overlap with features of student information systems and learning management software also in use on campus, which leads to a sense that efforts are being duplicated.

Benefits and Costs

It appears that at best, it is too soon to tell whether the AMSs are meeting campus needs. As noted above, it might depend on how needs are defined, but at present, it seems that there are too many issues identified by the campuses for them to make any positive statements in this regard.

Benefits of having an AMS in place include that more accreditation agencies and employers are interested in electronic evidence of student work, and having an AMS will support that demand. Another benefit is the rapid turn-around for assessment results, so feedback for improvement can be used immediately. Costs include time, money, and the need to continually work with faculty and students for training and to encourage use of the AMS.

Campuses with Learning Outcomes Assessment Not Supported by Electronic Systems

Although there is wide variation, program level outcomes assessment has had a longer history in most of the institutions surveyed. With a few exceptions, institutional level assessment is comparatively more recent. There is also considerable variability in the specific processes used to collect and evaluate student work for either program or institutional level assessment.

Description of processes: Collection and Assessment of Student Work - Reporting of Assessment Data

For institution level work, the framework typically applied is similar to the model recently used by the state in its piloting of learning outcomes assessment across campuses. That is, student products related to specific learning outcomes are collected in hard copy and rated by faculty members in face-to-face group scoring sessions, using a tool such as a rubric, and including norming and multiple readings. To the extent that data are aggregated, they are collected and analyzed using spreadsheets or statistical software programs. A fair description of most of the institutional level work is that it mainly involves collection from faculty who have appropriate assignments and are willing to submit student products. In a few of these cases, criteria for assignments or students are specified, but there is still a dependence on faculty volunteerism.

For program level assessment, the program review process adopted by the institution largely provides the framework for programs to develop outcomes, and report on assessment activities. The type and regularity of assessment work conducted within programs varies considerably, as does the extent of participation in this work across the many campus programs. Common approaches include collecting and scoring student products, rating student performances such as class presentations or behavior in clinical placements, and scoring in-class examinations.

An exception to the non-systematic nature of program level assessment is assessment carried out by programs with external accreditation where the external agency mandates the regular

assessment of student learning outcomes. These are the programs which have the most highly developed processes with defined student learning outcomes, constrained student artifacts, and scoring instruments linked to the student learning outcomes. The best example is in teacher education programs in four-year institutions which have been using student teaching portfolios for many years. Most of the programs in the state are accredited by the National Council for the Accreditation of Teacher Education/ Council for the Accreditation of Educator Preparation (NCATE/ CAEP), as well as receiving Massachusetts Department of Elementary and Secondary Education (DESE) oversight. The complexity of the data management required for accreditation has driven most programs to some form of electronic data management although not necessarily to the use of e-portfolios

The mechanisms used for reporting results of learning outcomes assessments range from feedback to individual students to presentations to college wide meetings to written reports, often prepared as part of program reviews or accreditation demands. The most common method appears to involve discussions at departmental or program meetings, but there are also approaches that are unique to an institution, such as involving website postings.

Use of Portfolios

One institution uses portfolios for learning outcomes assessment. Three institutions not using portfolios for learning outcomes assessment do report use – mainly limited - of portfolios by individual programs as teaching and learning tools. This includes both hard copy and e-portfolios. There are 2 different software packages in use on the 3 campuses, each of which has the capability to be used as an AMS.

One institution reported prior use with e-portfolios on campus, but the effort was determined to be unsuccessful due to lack of student motivation, and the time commitment required from both faculty and students.

Level of User Support

Some institutions report that the level of faculty participation in and responsiveness to learning outcomes assessment activities is fairly good, while others report it as low, responses which vary by program. Several noted efforts on their campuses either in place or planned to improve or increase faculty participation.

Resources Used

The most frequently mentioned resource used to support learning outcomes assessment activities was a campus outcomes assessment committee, where faculty participation was at least in some cases supported by stipends. Release time and stipends for faculty raters of institutional and/or program level student products were also mentioned.

Benefits and Costs

Whether or not a process is meeting institutional needs depends on how that need is defined. Several report that the needs are being met, although perhaps in a limited way. Reports include a need for continued development and improvement of processes, including decreasing the interval between collecting products and reporting results, and a need to develop more faculty champions and increase faculty participation in the processes.

On the positive side, the processes and activities in place and being promoted have stimulated at the very least campus awareness and perhaps acceptance of student learning outcomes

assessment work. At the other end, one campus reported that faculty are on their way to "embracing" this work. The need for continuing improvement efforts is acknowledged, with respect to, for example, the level and quality of faculty involvement, and the need for improving the "closing the loop" activities. Costs include the demand placed on faculty time, and the funds necessary to support faculty involvement, for example, on assessment committees.

Whether Considering Adopting an AMS

Several institutions without AMSs have developed specific plans for implementing such a system in the near future. Reasons for the proposed adoption include outcomes assessment, but also may be specifically for use as a teaching and learning tool without the emphasis on data aggregation or program assessment. A few institutions not considering such a system cite its resource requirements – money and staff – which are currently not available, or a need to more carefully describe institutional needs which would be addressed by such a system.

Discussion

Whether institutions are using an AMS or not, it appears that there is a commitment to learning outcome assessment at both program and institutional levels, but the processes in place for doing this vary considerably. How institutional assessment is defined also varies, and may include all programs at the institution or be limited to a major department or academic division. In general, there are significant gaps in the number of programs participating, the type and extent of assessment work being conducted, and the proportion of outcomes adopted by the institution that are assessed.

A few campuses require all students to participate in institutional outcome assessment, and specific processes have been developed for that purpose. At many campuses, however, institutional assessment efforts largely depend on faculty or students volunteering to submit products. Without high levels of participation, the students whose work is sampled are likely not representative of the population of interest, and generalizing across the institution in terms of levels of students' competency is not possible. In some contexts, this might be viewed as a shortcoming: for example, accreditation and external accountability cannot depend upon such measures. In the context of campus level assessment, however, the desired goal is to have information which stimulates discussion and the development of action plans related to improving student learning. In that sense, the reporting out of data, considering the degree of its fit with faculty experiences, and planning actions become the critical steps.

As detailed in the ***Results***, campuses with AMSs report a rather long list of concerns and barriers – both technical and human - to implementation and use. Many could be overcome with sufficient time and money for training and on-going administrative support. Integral to the structure of most AMSs, however, is a lack of integration between the learning management system and student information system in use on campus and the AMS itself. This can lead to duplication of data entry. Faculty perceptions concerning the extra work load, the potential for unauthorized use in faculty evaluation, and some preferences to collect, read, or grade paper products affect the level of faculty use and support of the AMS. These faculty concerns were not unique to campuses using assessment technology however but were expressed in a number of institutions not using an AMS, where efforts to increase faculty participation in assessment are planned.

Interestingly, assessment costs and desired benefits identified by institutions fell into similar general categories whether the campus used an AMS or not. For example, one of the benefits of an AMS is the ability to rapidly aggregate and report results - a feature which may increase the availability and meaningfulness of assessment results. In turn, this can assist campuses in improving their "closing the loop" activities, a need identified across many of the campuses surveyed. Costs for AMS campuses in addition to the purchase of the system include needs for faculty and student training. Across AMS and non-AMS campuses costs also include demands on faculty time, and the need for institutional efforts to promote faculty engagement and participation.

Conclusion

Questions we are left with include:

- Why, with all the tools available and all the experience around us, have we had such limited success in the adoption of assessment technology?
- What is the real need for an AMS?
- Is the investment by campuses worth the cost?

Over the past several decades, numerous commercial and open source computer programs have been developed to support assessment of student learning and the analysis of assessment results. The functions and features included in these electronic tools reflect the tension inherent in the assessment process itself: is its primary purpose to support learning and program improvement, or is it to satisfy demands for accountability? This suggests a first step for institutions in selecting and implementing any assessment system is to identify the purpose or purposes that will be served by the AMS, followed by a determination of institutional needs or expected benefits. In addition, the availability of the technological and human resources needed to support and sustain implementation and use, and factors identified as interfering with or facilitating this use must be considered.

According to McCann (2010), who investigated the adoption of a pure (that is, one that did not support collection and scoring of student work) assessment management system at one university through interviews and surveys, the factors that promoted adoption and use of an electronic assessment system were direct requirements for use, compatibility with one's one work style and role in campus assessment efforts, and training in use of the system. The significant factors impeding use of the system were its cumbersome and unappealing interface as well as the incompatibility of the process with faculty priorities and culture. Since the AMS was used only for the reporting of assessment results rather than for assessment directly, it was seen as irrelevant to their work, or worse, a means of evaluation and administrative control.

Sivakumaran, et al (2010) examined adoption and use of e-portfolio linked AMSs by three accredited teacher education programs. NCATE has extensive requirements for outcome assessment for all students, and while they do not mandate use of an electronic system, it is highly desirable. Furthermore, the specialty professional associations involved in NCATE accreditation require the use of authentic student work as evidence for meeting learning outcomes. These conditions promote the acceptance and use of AMSs by education faculty. Despite the favorable climate for AMS adoption, much planning and ongoing support was required. They found that commitment from administration was critical and that faculty had to support the use of the system. They also noted that maintenance of the system had to be the designated responsibility of an individual. This, and on-going training needs, increased the cost

of AMS use. Finally, the authors warn against over-use of the system—trying to collect too much—and against adopting systems with more features than necessary. A needlessly complex process or technology inhibits productive AMS use.

Many of these same factors noted in the literature were identified in our campus interviews. We do note that requiring participation increases use, as does the ready availability of training support. The most successful adoption we observed occurred within a program subject to specialized accreditation. Use of the AMS by students and faculty was mandatory and supported by video tutorials, locally produced manuals and live one-on-one support. However, for many of our campuses, requiring use is not an option. And there are the continuing issues associated with costs to the institutions, in time and money.

The results of this research suggests the importance of campuses carefully evaluate its outcomes assessment process needs, whether an AMS system will meet those needs, and if so, whether the institution will be able to provide the resources needed for full and effective implementation. For small programs, the benefits of converting paper- and spreadsheet-based assessment processes to a centralized AMS do not compensate for the costs of adopting and maintaining and AMS. Another primary factor is the fit of the AMS with the culture of the institution, as defined by it policies and practices, and, in the absence of a campus requirement, by faculty support. Some suggestions have been offered that perhaps an AMS could be adopted in certain programs, with interest and support increasing then to other areas of the campus. This requires a commitment to the software costs, while experience from practice is that this "spread" is not is not assured.

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