Electronic Assessment Systems – Pros and Cons of a Homegrown, Commercial and Hybrid System

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Abstract

This paper is focused on the use of technology in teacher education assessment. Due to the recent emphasis on comprehensive electronic assessment systems by NCATE, colleges and universities are in a position to establish the system that will best fit their needs. There are several possible models for electronic assessment systems. These models: commercial, in-house and a hybrid system will be explored and discussed, highlighting advantages and disadvantages for each arrangement.

Keywords: Assessment, ePortfolio, hybrid system, comprehensive assessment systems, teacher education

1. Introduction

The adoption and use of technology in teacher education assessment prior to the National Council of Accreditation in Teacher Education's NCATE 2000 standards was a slow process that could be described as piecemeal at best. However, in recent years the development and use of comprehensive electronic assessment systems has been pushed forward dramatically by NCATE's move to a digital accreditation process. This push was to answer the call for evidence of effective teaching based on research. Therefore the accreditation process for NCATE now requires that colleges build and maintain an assessment system (database/s) capable of storing, aggregating, disaggregating, and analyzing student and unit data to evaluate the effectiveness of teacher education programs. Additionally, as a part of the accreditation process colleges must demonstrate how data is being analyzed, shared, and used to make program and unit improvements. Comprehensive systems are relatively new, especially as a requirement of the accreditation process. In fact, the 2005-2006 year was the first academic year in which a fully functional system with a complete set of data had been required by NCATE.

The issue has become not only a question of how to assess students, but how to represent their skills, knowledge, and dispositions in a digital manner that permits all stakeholders, including the students, to be aware of the progress being made. Many universities have turned to electronic assessment systems as a solution. Indeed one of the driving forces underlying the adoption of a data management system for most universities involves meeting state and national accreditation standards (NCATE). Institutions have taken different routes in creating electronic assessment systems. The three different types of systems are available, one being built in-house, one that is commercial, and finally one that is a hybrid (half in-house and half commercial). One key question that will be addressed iswhat leads to an institution using one of the three different types of electronic assessment systems?Another pivotal aspect of this research is the process that goes into designing an electronic assessment system. Finally, what process did the institution use to implement and maintain the electronic assessment system?

2. Literature Review

Institutions can readily see the advantages that e-portfolio systems hold for tracking student attainment of standards, as well as the potential for holding data regarding accountability and accreditation (Barrett, 2004).

If the data are managed appropriately, assessment evidence for both teacher candidates and unit accreditation may potentially be extracted from the same student archival databases. A challenge does arise when the same e-portfolio system is used for both student-centered purposes and for satisfying institutional needs such as program evaluation and accreditation. While electronic assessment systems are not the same as electronic portfolios, the terms have unfortunately become interchangeable and this has confounded research in this area. Program and unit assessment requires the aggregation and disaggregation of data collected in order to analyze program, department, and unit progress toward meeting state and national standards. While e-portfolios provide a valuable source of data, most if not all fall short of supplying all the data needed in the accreditation process and many universities are finding the need for a database that encompasses more than student worksamples or artifacts. The database or databases must bring together data from multiple sources including student e-portfolios, university student information systems, and data from various individual programs.

Questions arise as to how to build such a system and what data to include. NCATE 2000 Unit Standards state that, "The unit has an assessment system that collects and analyzes data on the applicant qualifications, the candidate and graduate performance, and unit operations to evaluate and improve the unit and its programs" (NCATE, 2000). This system must address performance, process, and programs. In regard to performance, systems look to collect data beginning with admission criteria for potential candidates and continuing with data to assess their knowledge skills and dispositions as well as their impact on P-12 student learning. The system must measure the effectiveness of activities and procedures and how they impact candidate performance. Additionally the system must be capable of breaking out data related to specific program standards (Gendernalik-Cooper, 2002).

NCATE recognizes the complexities of teaching as a profession and demands an assessment system that is broad based including multiple data points and assessments that reflect the level of candidate performance as well as program effectiveness.There are a number of commercial electronic assessment systems available and behind them you will find powerful databases that can be used to collect, store and aggregate data on various groups of students. Finding or developing a comprehensive system can be fraught with pitfalls. At best, it is a daunting task considering what data to collect, how to collect it, and how to represent it in a useful way. Developers must consider what data is useful, what data should be required, what data would be helpful to have and how much is too much?Comprehensive assessment systems require a substantial commitment of financial resources and of time both administratively and by faculty. The current fiscal climate and the structure of reward systems in higher education do not lend themselves to assessment becoming an across-the-board priority.

NCATE 2000 standards provide a major impetus that forces changes in fiscal priority, however without additional dedicated funding this forced reallocation of existing funds is often very unpopular. Additionally, the fact that not all institutions are bound by NCATE 2000 standards puts participating institutions at a strategic disadvantage. Teacher shortages and the advent of alternative licensure routes that do not hold candidates to rigorous standards work to undermine traditional teacher education programs. Institutions find themselves in the position of enforcing more rigorous assessments of relevant standards (NCATE) on the one hand, while on the other hand working to eliminate unnecessary barriers to those choosing to switch careers through alternative routes of licensure. It is difficult to adequately document the knowledge, skills and dispositions of those that only partially participate in a complete course of study.

Comprehensive assessment systems can make a difference in the quality of teacher preparation programs but only if all candidates are accountable to the same state and national standards. The research in value added scores show promise in documenting this premise. The ability to break out value added scores by licensure path and institution should provide a picture not only of institutional effectiveness but program effectiveness as well. The ability to aggregate student value added data will be a valuable addition to current efforts in teacher education assessment. This type of study has only recently been made possible and the results loom large in the future assessment of teacher education programs across the country.

3. Methodology

A case study methodology was applied for this study. Yin (1994) the case study as a methodology questions such as "how" or "why" are raised, when the investigator has little control over events, and when the researcher is investigating phenomena in a real life context. The current study meets these criteria.Three institutions, one that used a homegrown electronic assessment system, another that used a commercial system and finally one that used a hybrid system were analyzed.

Assessment coordinators from each institution were given a set of questions that addressed the following areas:

- What led to their institution using one of the three different types of electronic assessment systems?
- What process went into designing their electronic assessment system?
- What process did the institution use to implement and maintain the electronic assessment system?

4. Analysis

4.1 Resource and Manpower available

When choosing an electronic assessment system, the first step is to consider the resources and manpower available within the institution. If there are limited resources in terms of finances and staff to implement, maintain and support, then the best option would be going the commercial route. The advantage of going the commercial route is that the company will create the system, continually upgrade and enhance the system and provide technical support. Additionally, the cost of the commercial system is usually passed onto the students, as they pay the commercial company a fee for using the system. If an institution goes with building their own system, first there has to be IT support to help build the system, maintain it and then continually upgrade it. Beyond IT support, institutions will have to take into consideration hardware and software required to design, implement and maintain the system. Over time, server space, upgrades to computers and software licenses must be accounted for when deciding to go with a homegrown system. Unless the institution charges the students a fee to use the system, there is no revenue generated by the system. This means that the institution has to continuously bear the cost of maintaining and upgrading the system. During tough economic times, this maybe a difficult proposition. Another factor to consider in a homegrown system is who will provide technical support and the cost associated with the support. By using a hybrid system institutions still have to rely on a commercial company but for their homegrown part they will still have to hire IT personnel to help build and maintain the system. Hybrid systems can eliminate some of the cost associated with a homegrown system, but there will still be a financial burden on the institution for the homegrown side. Another factor to consider when using a hybrid system is that students, faculty and administrators will need to be trained to use two different types of systems. And when collecting data questions that need to be answered, both systems would need to integrate with each other or the data will be collected separately and then manually combined. If the latter is true, additional time would be required and data accuracy might be compromised.

4.2 Design of the system

In creating a homegrown system, it is very important that IT staff work hand-in-hand with teacher education faculty members and administrators. While IT staff can write the code to make the system run, they have to work with faculty members and administrators to know what type of data the system needs to collect, the flow of the information into the system and access to the system by various stakeholders. One of the main advantages of a homegrown system is that the system can be designed specifically for the needs and assessment methods of that institution. By building your own system, IT staff can work with campus computing staff to help the electronic assessment system integrate with the campus computing system, such as Banner or Blackboard. Once the system is completed, continued communication is necessary between IT staff and numerous users to make sure the system is working efficiently and providing the necessary information to faculty and administrators. Due to continued changes to standards and requests for data by national and state agencies, it is important that IT staff is continually upgrading the system, so the system has flexibility to grow. In addition, continuous upgrades of hardware and software are required to keep the system modern.

Using a commercial electronic assessment system, it is important to carefully choose the right system. It is key to find a system that best fits the assessment methods and can provide the necessary data in an efficient manner. Once a system is chosen, the next step is to choose the correct personnel, whether it be a staff person, faculty member or administrator to help now transform the paper and pen version of the assessment system into the electronic assessment system. Due to the fact that it is a commercial system, which is not custom made for a particular institutions but rather for everyone, it might not be possible to identically create the paper and pen assessment system into the electronic assessment system. The person(s) who will be working on transforming the paper and pen assessment system into an electronic one should be technologically savvy and good at problem solving. Working hand-in-hand with the technical support provided by the commercial company is important in this process. This will allow IT support from commercial companies to tell the institution what can be done, what can't be done and how to adjust the system to meet the needs of the institution.

Working with the technical support staff also helps them understand how you are using their product, which in turn will help them provide better support for your students and faculty. If an institution chooses to go with a hybrid system, it allows them to pick and choose which part they will create in-house and which part they will outsource. Depending on the financial and human resources, an institution will choose which part they can design, implement and maintain on their own and which part will be outsourced. By using a hybrid system the cost may at times be more than either going totally commercial or fully developing a homegrown system. One of the major issues that will arise when going with a hybrid system is how data from both systems will be combined. If the commercial system and the in-house system are not integrated, then data will have to be manually combined or be fed electronically into a third system that will combine the data. Time and accuracy of the data set might be compromised depending on the process.

4.3 Implementation and Maintenance of the system

Whether it is a homegrown, commercial or hybrid system, personnel at each institution will have to train their students, faculty and administrators on how to use the system. One advantage of using a commercial system is that the companies will provide technical support for students and user guides. This reduces the amount of resources an institution has to use to help implement the system. By using a homegrown system, the institution's personnel have to create their own user guides and provide technical support. Hybrid systems will be a combination of the two above-mentioned systems. To have a successful and efficient implementation of any electronic assessment system, on-site training is key, which will require support and finances from the institution.

Continued maintenance and upgrades for the commercial system are done by the companies themselves. In order to continue to maintain the business of institutions, successful companies continue to upgrade their systems. Failure to maintain and upgrade their system might cause them to lose their clients. The maintenance and upgrades don't cost the institutions any financial resources but it might cost them personnel time, as personnel will have to be trained on the new upgrades. For homegrown systems, the key to maintaining and upgrading the system is financial resources. If the institution is willing expend the necessary financial resources necessary then a homegrown system can be successful. However if the institution is not willing to spend the money, the system will become outdated and frustrate students, faculty and administrators. In addition with continued changes to standards by various accrediting bodies, if the system is not flexible and doesn't get upgraded, it will not be able to provide the necessary data for institutions. A hybrid system provides the benefits of a commercial system and the disadvantages of a homegrown system.

5. Conclusion

Choosing the right electronic assessment system is vital to having an efficient and successful assessment and accreditation process. When deciding what type of electronic assessment system is right for the institution one of the key factor is the financial and personnel resources available at the institution. Depending on the financial situation, not just short term but long term, institutions can decide what is the best way to go forward in terms of selecting what type of electronic assessment system should be used. If finances are limited in the near future or long term, it would be in the best interest of the institution to choose a commercial one. However if the finances are healthy and will continue to be that way, then building an in-house system would be ideal. In-house systems give you the flexibility and custom design that fits exactly to the needs of the institution. Over time when it is necessary to make changes and add new components, it is easier to do that with an in-house system, than waiting for a commercial company to make those changes. Hybrid systems come with the pros and cons of using a commercial system and building an in-house system. The key in using a hybrid system is the integration of the data from both systems. If that can be done seamlessly and cost can be kept to a minimum, it is the best of both worlds.

References

Barrett, H.C. (2004). "Differentiating Electronic Portfolios and Online Assessment Management Systems." Proceedings of the 2004 Annual Conference of the Society for Information Technology in Teacher Education (Retrieved April 13, 2013 from: http://electronicportfolios.com/portfolios/SITE2004paper.pdf).

Gendernalik-Cooper, M. (2002). A Multi-Faceted Assessment System in a Collaborative Educator Preparation Model: Performance, Process, and Programs. Paper presented at AACTE.

NCATE.(2000). Professional standards for the accreditation of schools, colleges, and departments of education. Washington, D.C.: Author.

Yin, R. K. (2008).*Case study research: Design and methods.* Thousand Oaks, CA: Sage.