

Using LMS-Embedded Analytics to Evaluate an Online Competency-Based Program

Amanda Barefield, EdD & Georgianna Laws, MEd
Augusta University

Abbreviations

- **CAHIIM:** *Commission on the Accreditation of Health Information and Information Management.* CAHIIM publishes curriculum competency standards with which all HIIM programs must comply.
- **HIA:** *Health Information Administration.* HIA is the name of a program of study at Augusta University.
- **HIIM:** *Health Informatics and Information Management.* HIIM is the profession in general.
- **LMS:** *Learning Management System.* As an example, the University System of Georgia uses Brightspace by D2L as its LMS.
- **SLO:** *Student Learning Outcomes.* "Objectives" and "Outcomes" or "SLOs" are sometimes used interchangeably. In the context of accreditation, (program-level) SLOs refer to what students will be able to do as a result of the learning experience in their program.

Abstract

To better prepare the next generation of HIIM professionals and more closely align the HIA curriculum with profession-specific accreditation standards, a design team at Augusta University used LMS embedded analytics tools to track, and analyze over 100 program-level SLOs.

Problem

In response to how the rapid growth in technology has drastically reshaped the HIIM profession, CAHIIM recently published a new curriculum that doubles the SLOs graduates need to demonstrate (from 49 to 102) and introduces a variety of new content. With this additional knowledge and more closely defined competencies, HIIM graduates can more successfully integrate into the current and future workforce.

A leader in the HIIM education industry, with graduate first-time pass rates well above the national level, Augusta University endeavors to maintain a high-quality HIA program that prepares its graduates to excel as they enter the workforce.

As the HIA program at Augusta University prepares to implement the new CAHIIM curriculum by August 2017, it has to use its lean resources to:

1. streamline course offerings to meet CAHIIM standards in the most effective way
2. empower faculty to do their work in a way that generates rich, actionable data
3. analyze with ease the vast amount of course- and program-specific data generated for program evaluation and accreditation purposes.

It was imperative that a solution be identified to allow the HIA program to meet all three of these goals.

Process

While the first goal is underway (the streamlined curriculum has been drafted and progresses through the institutional approval process), the project team is focused on the second and third goals: the faculty and the data analytics. The team's solution involves leveraging Augusta University's LMS to offer and track the content, learning activities, and corresponding SLOs. The LMS will then allow the team to analyze the data and demonstrate how/where in the program SLOs are met. Led by the faculty project coordinator and the instructional designer/project manager, this endeavor involves multiple stakeholders, spans a two-year time frame, and takes place in several stages, as described below.

Initial Talks

The project began with an initial inquiry meeting between the faculty project coordinator and the instructional designer (soon to become project manager). During these preliminary talks, all necessary stakeholders for the project were identified, as noted in Figure 1.



Figure 1: Project Stakeholders

The project proposal was then discussed within various layers of leadership and was approved. Next, the faculty project coordinator and the instructional designer staged the project and created a scaffolded timeline to include all major project milestones.

Timeline

The existing curriculum (based on 49 SLOs) will be phased out within a year and taught in parallel with the new curriculum (based on 102 SLOs), as illustrated in Figure 2. Thus, by Fall 2017, the HIA program will not only be capable of demonstrating compliance with the new CAHIIM curriculum, but it will also benefit from lessons learned during the two-semester pilot.

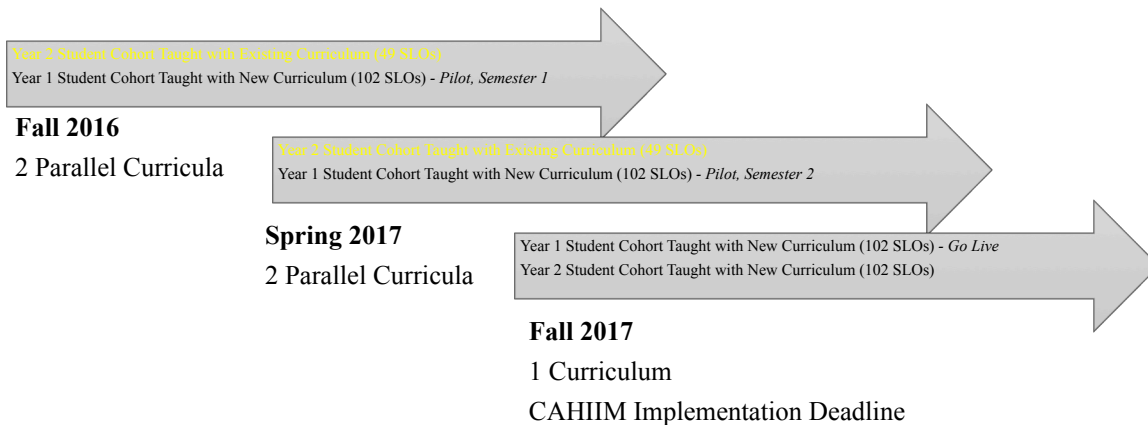


Figure 2: Existing Curriculum Phase-Out and New Curriculum Rollout

The team further segmented the timeline into seven stages, as follows:

Stage 1: Curricular Mapping

The program previously conducted a gap analysis based on the new CAHIIM curriculum standards. The instructional designer used the gap analysis to map the 102 CAHIIM SLOs to the new curriculum.

In the process of mapping, the team eliminated curricular redundancies and clarified course ownership across the HIA program (most courses are HIA native and a few are taught through other Augusta University programs).

Stage 2: Small Scale Prototyping

The project involves creating LMS competency structures, connecting the objectives within those structures to graded activities throughout the curriculum, and generating LMS reports to capture how/where the objectives (or SLOs) are met.

Stage 2.1: On Paper

The competency structure was first sketched on paper, at a small scale. This initial rendering revealed the need for bridging the gap between:

- CAHIIM's terminology (domain, subdomain, and competency),
- Augusta University's terminology (SLO), and
- The LMS's terminology (competency structures comprised of competencies, objectives, activities, and grade items).

The team chose to adopt the LMS's terminology as a standard in all communications, to maintain a common and consistent language. However, the term "SLO" is preferential over the LMS's "objectives" as it is a conventional term utilized at Augusta University.

Also during this stage, the team generated the questions that the LMS reporting system will answer regarding how SLOs are met by individual learners within a course and across the entire program.

Stage 2.2: In the LMS

Next, the team moved to a small-scale prototype in the LMS test environment. The instructional designer created three test courses to encompass sample graded activities tied to objectives that are then linked to the competencies in the LMS competency structure. Test student accounts were used to simulate various learner proficiency levels ranging from 0 to 100%. The LMS's competency structure analytics tool then portrayed the results in terms of objectives being met (above the set 70% proficiency threshold) or failed.

At this stage, the team learned several important lessons:

- One missing piece of the competency structure linkage resulted in false negative feedback regarding students achieving the SLOs.

- Several tasks anticipated to go by quickly actually took longer due to the availability of the LMS expert to assist with the technical issues encountered (as a matter of fact, the LMS expert with whom the team worked for over a year moved on to different employment, so the team had to identify a new expert in competency structures and LMS analytics).
- As we were troubleshooting technical issues, we found the use of common terminology to be vital in successful team communication.
- Specificity in technical troubleshooting was also paramount. Miscommunication by lack of context arose when using screenshots that only captured a portion of the screen (that looks the same in many of the LMS's tools) and not the full context in which the technical issues occurred.
- The LMS test environment did not have all the necessary analytic tools for the project team to fully execute the prototype (due to additional cost). The project team therefore had to abandon the test environment and move to the live LMS environment.

Stage 3: Initial Course Owner Meetings

Since the small-scale prototyping was successful, the project team moved to the next phase of initial talks with the faculty in both the HIA and non-HIA native courses. This stage was used to provide an overview of the project and its primary purpose to meet accreditation requirements. Faculty were reassured that the course SLO performance reports would be accessible by the HIA program director *only*.

The crucial role *all* faculty play in the project's success was communicated; in order to accurately track SLOs at the program level, every course faculty must use the LMS to deliver activities/grades and attach each activity/grade to the appropriate competency structure in the LMS.

Since this project involves additional workload for the course faculty, the team offered support for these activities before and during the pilot and go-live phases. The project team presented the levels of support available to all faculty (see Figure 3).



Figure 3: Instructional-Design Support Levels

Stage 4: Building All Necessary LMS Components

This stage involved building the actual competency structure in the LMS. A Fall 2016 preparation course shell was built for every course in the program used for the new curriculum.

The "HIA Accreditation Project" module (available to faculty teaching HIA courses but invisible to the students) was added to each HIA course in the LMS. This module contains:

- a list of the SLOs that need to be met in the course according to the program's new curriculum
- any materials developed with the instructional designer
- a link to material hosted on the project website, including:
 - custom-made assignment and rubric templates

- custom-made video tutorials covering the essential skills faculty will need to perform (i.e., create assignments, create rubrics, create a gradebook, link all three with one another and with the corresponding SLO)
- the contact information of the instructional designer, instructional systems analyst, and 24/7 help desk.

The project website will be used in training the faculty and will also be linked within each HIA course. Maintaining a website to distribute information ensures that all faculty have access to the most current/up-to-date information and allows the project team to communicate updates from one central location.

Stage 5: Faculty/Course Owner Training

Although this stage is not completed at the time of this publication, it includes the offering of individual hands-on training to all HIA native core faculty, HIA native contract faculty, and non-HIA native faculty. The training covers all aspects of the tasks needed before the semester begins (building and linking activities, rubrics, grades, and linking to the existing SLOs) and during the semester (grading and identifying which SLOs are met/not met).

During the training sessions, each faculty chooses the desired level of support. For example, a faculty member choosing to have the designer most involved would choose levels 1, 3, and 5 (refer to Figure 3), whereas a faculty member choosing to have the designer less involved would opt for levels 2, 4, and 5 or less.

Stage 6: Two-Semester Pilot

While still a work in progress, this stage includes building the prep courses, putting the "HIA Program Accreditation" module in place, and training faculty in all the tasks they'll need to complete.

Stage 6.1: Before the Fall 2016 Semester (Pilot 1)

Before the first pilot begins, courses need to be prepared, as follows:

- For those who opt for support levels 1 and/or 3 (have course components built and post-produced in the course), the faculty and designer will choose a timeline for their collaboration, ensuring that the respective work is completed before the start of the Fall 2016 semester.
- The faculty members who opt for support levels 2 and/or 4 (using templates and training videos) are responsible for building their own course components, consulting the templates and videos available, as needed.
- The designer will copy *all* the prep course shells into the live semester shells before students gain access to their Fall 2016 courses.
- The designer will also assist with support level 5 (helping as needed).

Stage 6.2: During the Fall 2016 Semester (Pilot 1)

During the first pilot, assignments will need to be completed/graded and an SLO-mastery support process initiated whenever students are unable to meet the SLOs.

The instructional designer will continue to troubleshoot on request (support level 5) and will maintain contact with all faculty to offer just-in time support or training.

By the middle of the semester, the instructional designer will create Spring 2017 prep shells (complete with the "HIA Program Accreditation" module), allowing faculty to start working ahead.

Stage 6.3: After the Fall 2016 Semester (Pilot 1)

At the end of each semester, the program director generates end-of-semester reports and to determine if SLOs are met/not met. If SLOs are identified as not met, the program director will consult with the respective faculty member(s) to determine the need to modify the instructional materials and/or clarify the activity instructions to ensure success on those specific SLOs.

Stage 6.4: Before the Spring 2017 Semester (Pilot 2)

This stage of the pilot will include review of the results from the Fall 2016 pilot phase and courses will be modified based on the formative feedback obtained. The project team will then repeat stages 6.1 – 6.3 of the project for the Spring semester.

Stage 7: Go Live

This phase will begin with the review of all feedback generated during the pilot stages of the project. Modifications to course or processes will be based on the results of the LMS analytics reports and feedback from HIA faculty. Once these modifications are complete, the program will implement the new curriculum in all HIA courses.

Recommendations

The biggest lessons the team learned in taking on this massive project are as follows:

- identify all stakeholders impacted by the project
- gather all team members with a variety of talents (subject matter expertise, pedagogy, instructional design, technology, etc.) that will execute the project
- an experienced project manager is essential in leading the team and meeting deadlines
- use an intuitive project-management system; the more user friendly it is, the more likely the team will make use of it
- start early and expect the unexpected (technical issues, staff turnover, etc.)
- don't skimp on sketching (on paper) and prototyping (in your LMS live environment)
- small scale tests are more effective as full-blown tests (agile design allows immediate remediation of problems encountered and can be scaled to the whole implementation)
- roll out the project in order of importance of tasks (if A fails, then B-Z are not necessary)
- get leadership and faculty buy-in as early as you can
- offer to be as hands-on or hands-off as faculty desire
- always have a plan B for business continuity purposes
- invest time and effort into creating reusable templates, tutorials, etc. and place them in a central place to which you link in all courses
- have an SLO-mastery support process in place during each semester
- go through formative reviews of instruction and activities (not SLOs) in between semesters
- provide plenty of time to pilot your project (as many semesters as you can).

Conclusion

Although preparing the next generation of HIIM professionals by aligning the HIA curriculum with profession-specific accreditation standards is a formidable task, the HIA design team at Augusta University used LMS embedded analytics tools to track and analyze over 100 program-level SLOs.

The team used a comprehensive development and implementation process to succeed in this project. This included the use of technology skills, learning design, leadership, and an existing technology infrastructure. The results of this project supports the case for using LMS analytics to evaluate mastery of your accrediting body's SLOs.

Amanda C. Barefield, EdD, RHIA, LNHA is an associate professor in the Health Information Administration Program at Augusta University, 1120 15th Street (EB 1022), Augusta, GA, 301912. Email: abarefield@augusta.edu.

Georgianna Laws, MEd is an instructional designer at Augusta University, 1120 15th Street (EC 1207B), Augusta, GA, 301912. Email: glaws@augusta.edu.