A Large Scale Project to Develop Personalized Learning Pathways at a University

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Abstract

Traditionally, online learning has been limited to written lectures, readings, discussions, and assignments with an occasional video presentation or simulation included due to the limitations of technology (Kirkwood & Price, 2013). While this form of learning has served the online environment well, the process does not address individual student learning needs. Literature has long suggested that students learn differently and bring different kinds of knowledge to each course (Anderson & Adams, 1981). In the online environment there is lower retention and CSU-Global started this project believing that better student interaction with the materials and the faculty would increase retention by giving the students a more personalized approach (Bawa, 2016).

Two years ago, CSU-Global, a totally online institution, made a strategic decision to develop multiple pathways for students in every course to enhance student learning and give students the opportunity to navigate the information in the course in a way that suited their needs and their personal learning style. Research suggested that adaptive learning, or personalized learning, often supported in K-12 education, continued with adult learners, especially college students. Personalized learning allows students to determine if they already know enough of the subject to meet the outcomes, offer opportunities to explore a subject more deeply, and get support when they need it through additional materials. This article documents the success of changing courses so that students are engaged and their retention and grades increase while giving each student the opportunity to experience a personalized learning pathway.

Introduction

Traditionally, online learning has been limited to written lectures, readings, discussions, and assignments with an occasional video presentation or simulation included due to the limitations of technology (Kirkwood & Price, 2013). While this form of learning has served the online environment well, the process does not address individual student learning needs. Literature has long suggested that students learn differently and bring different kinds of knowledge to each course (Anderson & Adams, 1981). In the online environment there is lower retention and CSU-Global started this project believing that better students interaction with the materials and the faculty would increase retention by giving the students a more personalized approach (Bawa, 2016).

Technology has advanced significantly since then and online courses have a plethora of new opportunities to enhance student learning. Technology has made information available with the click of a few buttons or a voice command on a variety of devices. However, the concept of personalized learning for higher education has only caught on in single courses or programs and not on a large scale. Educators need to embrace technology to assure students are learning what they need to be successful.

Personalized learning has been used in K-12 as a way for teachers to interact with students on an individual basis. It has been recognized as a very effective teaching methodology and has been employed in K-12 since the early 2000s (Yun-Jo & Reigeluth, 2011). The concept of personalized learning dates to Aristole (Bronstein, 2016) or at the very least Rousseau (1912). The students who are now entering college have in most cases been exposed to personalized learning and may not understand why it does not exist in their college environment. In addition, college students live in a technology centric world and have access to a variety of devices that can provide instant access to information.

In a face to face college classroom, the student with a keen interest in a subject has an opportunity before or after

class to engage the faculty in discussion, ask for additional materials, and attend other activities presented in the subject area. And the faculty may recognize and approach a student to support what the faculty perceives as an interest through reading papers, in class discussions, etc. This environment is difficult to replicate in an online class, which is often built without opportunities to interact with faculty beyond the course. Online instructors do not often take the time to supplement the course with opportunities to interact with students through discussion forums, messaging systems, synchronous conferencing and other features within an LMS.

Online courses are delivered through a Learning Management System (LMS), which has traditionally been structured to support lecture, reading links, discussions, and assignment submissions. However, in the past few years, LMS technology has evolved so that other avenues are available to provide more diverse learning environments online, giving higher education the opportunity to develop personalized learning paths for online students.

Two years ago, CSU-Global, a totally online institution, made a strategic decision to develop multiple pathways for students in every course to enhance student learning and give students the opportunity to navigate the information in the course in a way that suited their needs and their personal learning style. Research suggested that adaptive learning, or personalized learning, often supported in K-12 education, continued with adult learners, especially college students. Personalized learning allows students to determine if they already know enough of the subject to meet the outcomes, offer opportunities to explore a subject more deeply, and get support when they need it through additional materials. This research provided an opportunity to CSU-Global in an attempt to keep students engaged in their courses (Entwistle & Ramsden, 2015; Jones, Reichard, & Mokhtari, 2003; Wilson, 1981).

Process

After developing several courses with additional learning opportunities, CSU-Global launched a series of pilots in 2017-2018 to determine if students found adding personal learning pathways to the classes was helpful. The pilots were conducted in several different types of programs at both undergraduate and graduate level. Students were not told of the changes and data was collected across several terms.

Each course in the pilot was reviewed and revised to include opportunities for students to do a deeper dive into the materials to expand, enhance, or provide further explanation based on the student needs. The main structure provided included pathways just a click away for the students to use at their discretion. If they chose not to use it, they could successfully complete the course by following the main pathway. In addition, alternative presentations of the main material were provided, such as a video lecture accompanied by the script so that student could choose to read the lecture or listen to the lecture**.**

These pilots are still on-going, however, based on the preliminary results, CSU-Global launched a complete overhaul of all courses to include personalized pathways. They have been gradually introduced to the students and will continue until all courses are updated by July 2019.

After the pilot, which was successful with students both using and commenting on how they liked the expanded learning opportunities, CSU-Global took two years (2017-2019) to revise all 500 plus courses at the institution to add the personalized learning pathways. All new courses followed the new design model. For CSU-Global, the design process is a team effort that includes faculty, program chairs, content experts, instructional designers, digital architects, multi-media designers, subject matter expert reviewers, and advisory board members to assure the content is accurate

Each course is reviewed by the Provost and/or the Program Manager.

Data Analysis

Student Response

CSU-Global conducted several pilots (many ongoing) to test some of the new elements that were planned for the courses and surveyed the students about the new elements. The piloted elements include audio lectures, scenario based learning, and personalized pathways.

From the audio lecture pilot, where students had an opportunity to listen, watch, or read the lecture, students (N=321) in 5 courses 87% responded with agree or strongly agree when asked if they would enjoy seeing audio lectures in future courses. 10% of students indicated they did not use the audio lectures. 3% did not like them.

From the preliminary review of the course with all elements of personalized learning pathways in it, the students

(N=12) the students have indicated they are happy with the way the course is laid out with one student specifically indicating the pathways were helpful because the field is something they knew little about.

From the review of one course where an alternative scenario-based learning solution was included, the average score of 16 out of 20 was given to the question regarding the usefulness of the scenario for learning the course content (N=117). The comments in this section also provide some insight for course designers on creating a better set of expectations for the students. Students in the pilots also experienced a grade increase of about 4% in their overall score and retention in the pilot classes rose by 10% over the previous class.

The students had a variety of responses to the open-ended questions during the pilot courses. Many focused on the instructor or the content, despite being asked to focus on the new course. The opportunity to praise or complain about a course in an open ended proves too much for some students and they took the time express themselves regarding their whole experience. Since some of the later trials are still ongoing as of this writing. The comments on the course and/or instructor will be sorted, reviewed, and analyzed in detail once the trials are over. In addition, since the surveys are monitored by administration, any grievous errors or complaints are handled immediately. Most of the complaints are not serious.

The comments regarding the interactive format, however, were positive with such statements as:

"This was a good improvement. The previous style of interactive lectures was not up to par, especially for courses such as accounting. I found that the examples in the interactive lectures were most useful when the reflected the format of the critical thinking assignment."

" It presented an opportunity for cross-referencing as I worked my way through the understanding/applying/retaining process of learning. I hope to see more of that format in future."

"Enjoyed the new interactive lecture look and navigation very much."

Faculty Results

Faculty who participated in the pilot were interviewed to determine how they felt about the changes. 68% of the faculty in the pilot felt they had a better connection with their students in the class and reported more frequent personal conversations via messaging, phone calls, and 25% of those began posting weekly video announcements to engage students even more (it was not a requirement to post video announcements each week.) It should be noted that the faculty chosen to participate in the trial were already faculty with high student satisfaction ratings.

Involvement

The whole institution is involved in creating the pathways and have come up with unique and interesting uses of technology. The faculty engagement level in creating effective courses has been much higher than in the creation of traditional online courses. The course design teams have employed different technologies and ideas to create effective courses using models from other more limited applications (National Center on Universal Design for Learning, 2019; Planty, Hussar, Snyder, Provasnik, Kena, Dinkes, Kewal, Ramani & Kemp, 2008; Yang, Gamble, Hung, & Lin, 2014; Yun-Jo & Reigeluth, 2011; Zhao & Abuizam, 2015).

CSU-Global uses a centralized curriculum model. This model allows CSU-Global to track development expenses for each course development, determine the grades for the students in the revised courses, determine the retention rates, and review the student comments to assure that the costs have resulted in a better student experience.

Some of the elements added include video lectures by the faculty, lectures from experts in the field, links to websites important to the field, in-depth articles and papers for students interested in further explanations, small vignettes where faculty explain contents in detail, and use of scenarios both in-house and from other organizations. Students were given the opportunity to explore all or none of the elements. During the pilots, careful data collection was done to determine how many times students referenced the added elements.

In addition, faculty are now asked to post an opening video to their students at every class and to engage students weekly using alternative technology – not just an announcement posting - to help with student connection to faculty, as suggested by Mastel-Smith, Post, & Lake (2015).

For the course design team, the transition includes more effort to help faculty design personal pathways in the courses and keep the program and course learning outcomes in the forefront. They have been using various methods

of tracking the technology used. And they have developed their personal skills and knowledge, taking course design to a new level.

Administrators have been involved in reviewing and painstakingly evaluating the finished courses. Their goal is to assure that all the videos, links, and other technology work before the course is made available as well as assuring the flow of the course makes sense. They have also been tracking the usage and spending to assure the costs of overhauling the curriculum has benefited the students.

Lessons Learned

Others can learn from CSU-Global's processes to help improve their courses and provide personalized learning paths for students. The process is workable because it is scalable. An institution can take on the process wholesale for all courses or select just a few or even share it with faculty and allow them to determine how they will (or will not) implement it.

The first lesson was recognizing that not all students will be comfortable with a personalized learning path, especially if the target student audience is non-traditional. Some students will be happy with a straight path. It is important to provide a straight path, to remind students that they have choices, and let students know all choices are valid when exploring the content of the course.

The second lesson is creating a scalable schedule for the revisions. CSU-Global attempted to complete the entire update in one year, but it became overwhelming for everyone, so a new schedule was developed to stretch the goal to two years. The new schedule was developed with all partied involved to assure buy-in. And instead of releasing all the new courses in one term, the schedule was staggered, starting with the courses most students take first. Then as the progress through their program, they will not view the courses as radically different from their first course. Students like consistency in how their courses are presented.

The third lesson was recognizing the need to create and document processes and assure that everyone understood the expectations. At times there were several sets of documents floating around and causing some confusion. Once the processes and procedures were adopted, they were shared with everyone and the project ran more smoothly.

Considerations as PL Evolves

For CSU-Global, as the new courses are launched, the documentation, processes, and policies will be revised to assure that the personalized pathways continue to be a part of every course and all will be encouraged to stay abreast of changes in technology that will allow even further expansion of personalized pathways for students. Even now, as the last set of revisions are made to courses, members of the university are exploring new options, such as gaming as a learning tool, to see how it can be effectively implemented on a larger scale. Students Results

The CSU-Global President has made it clear that experimentation and challenging the way things are done is how CSU-Global will continue to grow as an institution and ideas and pilots are welcomed (Babson Study, 2015; Carlson, 2011; Lederman & Jaschik, 2013). There does not seem to be any issues when an idea is tried and fails as learning occurs from failures as well as success and the straight path in each course assures that the students have a clear path of engagement with the content and the faculty. The president's support of the program means that the funds are available if they are reasonable.

For resources, when presented with a solid plan, the administration rarely turns down the cost of technology and other resources. Overall, CSU-Global is willing to spend what is needed to engage students in learning and provide state of the art courses.

Conclusion

The way online courses have been developed dates to the early 2000s when the technology was limited. The model consisted of a written lecture, reading assignments, discussion postings, and assignments. Prior to this trial, faculty interaction was generally limited to email, comments on assignments and discussions, and announcements. The opportunity to develop personal relationships with students was isolated and the idea of giving students a personalize learning path was just not possible on a large scale because of technological limitations.

Students now have choices – they can choose what they needed or wanted in terms of the material. The added materials are just a click away, giving students the opportunity to explore more information if they are interested. Or

they could get extra help in understanding if needed. And they can choose to log in and listen to their lecture materials while commuting in an audio format or watch a lecture if they are in front of a computer.

With over 500 courses going through this revision process, CSU-Global is proving online courses can include technology to support personalized student learning and preferences for learning on a large scale. It is possible to use technology and keep courses relevant to students, their careers, and stay true to academia.

References

Anderson, J. A. & Adams, M. (Spr 1992). Acknowledging the learning styles of diverse student populations: Implications for instructional design. *New Directions for Teaching and Learning*, 49, pp. 19-33.

Babson study: Distance education enrollment growth continues, but at a slow rate. (2015). *Professional Services Close-Up*, Feb 9, 2015.

Bawa, P. (2016). Retention in online courses: Exploring issues and solutions—a literature review. *SAGE Open*. https://doi.org/10.1177/2158244015621777

Bronstein, D. (2016). *Aristotle on knowledge and learning*. United Kingdom: Oxford University Press.

Carlson, S. (2011). Carnegie classification update shows boom in for-profit and professional education. *The Chronicle of Higher Education*, 57(21).

Entwistle, N. & Ramsden, P. (1983). *Understanding student learning* (*Routledge Revivals*). London: Routledge, https://doi.org/10.4324/9781315718637

Jones, C., Reichard, C. & Mokhtari, K. (2003). Are students' learning styles discipline specific? *Community College Journal of Research and Practice*, 27:5, 363-375, doi: 10.1080/713838162

Kirkwood, A. & Price, L. (2013). Examining assumptions and limitations of research. *Br J Educ Technol*, 44: 536-543. doi:10.1111/bjet.12049

Lederman, D. & Jaschik, S. (2013). Affirmative action, innovation and the financial future: A survey of presidents. Retrieved from https://www.insidehighered.com/news/survey/affirmative-action-innovation-and-financial-future-survey-presidents

Mastel-Smith B., Post J. & Lake P.(2015). Online Teaching: "Are you there, and do you care?". *Journal of Nursing Education*. 54(3) 145-151. doi: 10.3928/01484834-20150218-18

National Center on Universal Design for Learning (2019). *The UDL guidelines*. Retrieved from http://udlguidelines.cast.org/

National Center for Educational Statistics. (2011). Mapping old post-baccalaureate award levels with new award levels. Retrieved from https://nces.ed.gov/ipeds/report-your-data/data-tip-sheet-reporting-graduate-awards

Planty, M., Hussar, W., Snyder, T., Provasnik, S., Kena, G., Dinkes, R., KewalRamani, A., & Kemp, J. (2008). The condition of education 2008 (NCES 2008-031). *National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education*. Washington, DC.

Rousseau, J. (1912). *Émile*. La Renaissance du Livre.

Wilson, J. D. (1981). *Student learning in higher education*. London: Routledge, https://doi.org/10.4324/9780429445569

Yang, Y. C., Gamble, J. H., Hung, Y. & Lin, T. (2014). Online adaptive CT−infused English literacy. *Br J Educ Technol*, 45: 723-747. doi:10.1111/bjet.12080

Yun-Jo A. & Reigeluth, C. (2011). Creating technology-enhanced, learner-centered classrooms. *Journal of Digital Learning in Teacher Education*, 28:2, 54-62. doi:10.1080/21532974.2011.10784681

Zhao, L., & Abuizam, R. (2015). The impact of adaptive learning in an introductory management distance education course: An empirical comparison. *Academy of Educational Leadership Journal, 19*(3), 359-365.