7-15-2019

Using Artificial Intelligence to Enhance Educational Opportunities and Student Services in Higher Education

Mandy Barrett, *Southwest Virginia Community College*, mandy.barrett@sw.edu
Lisa Branson, *Northern Virginia Community College*, lbranson@nvcc.edu
Sheryl Carter, *New River Community College*, scarter@nr.edu
Frank DeLeon, *Northern Virginia Community College*, fdeleon@nvcc.edu
Justin Ellis, *Reynolds Community College*, jellis@reynolds.edu
Cirrus Gundlach, *Paul D. Camp Community College*, cgundlach@pdc.edu
Dale Lee, *Mountain Empire Community College*, dlee@mecc.edu

Follow this and additional works at: https://commons.vccs.edu/inquiry

Part of the Community College Leadership Commons, Educational Leadership Commons, and the Higher Education Commons

Recommended Citation

Using Artificial Intelligence to Enhance Educational Operations and Student Services in Higher Education

The Case for Corequisite Instruction

Mandy Barrett, Lisa Branson, Sheryl Carter, Frank DeLeon,

Justin Ellis, Cirrus Gundlach, & Dale Lee

Introduction

"Good morning Alexa!" "Siri, what are the top restaurants near me?" "Google, turn off the lights and lock the doors." "Hey, my name is Michael, your chatbot avatar, how may I help you today?" These are all examples of how we use artificial intelligence (AI) in our everyday lives. AI can be used to perform simple tasks like making coffee in the morning or executing more complex chores such as vacuuming the floor without ever touching a vacuum cleaner. The increasing influence artificial intelligence has on everyday life cannot be escaped.

Artificial intelligence technology is becoming the basis for business. Most businesses use it to improve the customer experience. The education community is just beginning to find ways to successfully implement AI for staff and students. Artificial Intelligence should be leveraged to create a better student experience. For example, Elon University uses AI to assist students with tracking previously taken courses and helps them apply the information to their course-planning (Gardner, 2018). Georgia State University uses Pounce, a chatbot built by AdmitHub, reducing summer melt by over 20% by reaching out to students via text when they have not completed tasks by certain dates (Page & Gehlbach, 2018). The use of this technology can range from help with admissions applications and FAFSA completion, class scheduling, and campus tours. Using

AI within higher education will give faculty and staff the ability to be more effective and efficient when communicating with students.

ARTIFICIAL INTELLIGENCE

There are layers and levels to using AI within higher education. The basic level of artificial intelligence is considered conversational interfacing, which allows for surface-level interactions with students. According to Cheston and Shock (2017), "Conversational interfaces…let students interact with often complex services via messaging, something they do every day" (p. 4). There are limits to using this type of technology as the interaction can only go as deep as the knowledge of the student. For example, the artificial intelligence technology could only answer a direct question such as, "When does registration begin?" Conversational AI can only respond with a basic answer, the date. It cannot go deeper and provide other information that may be helpful to the student.

As in face-to-face communication, the words of the conversation are important, but the context of the words give the communication meaning. Contextual User Interface blends the conversational interface with traditional graphic user interfaces (buttons, lists, images, etc.) to help higher education institutions serve students more precisely. Utilizing the conversation with a contextual interface helps the student self-direct based on the information gathered from the conversation. This combination saves the student time and removes the frustration of lengthy textbot chatter. For example, a new student often will say he or she wants to register for classes. The contextual interface of the AI technology will provide the user with a series of steps which provide the student with the proper direction to follow. An added benefit is that contextual interfacing removes some barriers to equity, access, and opportunity but still leaves some places for improvement.

The next level of artificial intelligence connects the contextual aspect of conversation with the ability to interpret the unstated needs of the user. By integrating student behavior, curriculum pace, and progress, it is possible for AI to intervene (anticipate intervention needs) and "nudge" a student toward their next, best action or refer the student to an advisor/counselor. This level of AI will help students with maintaining pace towards graduation, completing necessary paperwork, and more. Nudges can also be useful to the institution by providing data that can be used for scheduling, program analysis, and making other decisions to make the institution more successful.

IMPROVING THE STUDENT EXPERIENCE

With the decline of students who are enrolling in and completing higher education, it is imperative schools look to use innovative ways to combat these trends. Artificial intelligence (AI) should be used to contest the trend of declining enrollment and completion in colleges and universities. How can the Virginia Community College System leverage AI to improve enrollment through completion system-wide? This is a difficult question to answer because of the varying factors within each school. These factors include student population size, infrastructure within the college and community, and cost. Even with all that being considered, the access AI provides can possibly mitigate most of these concerns.

Georgia State, an institution previously mentioned, has a student population that is sixty percent non-white, one-third first-generation, and fifty-eight percent receiving Pell Grants (McMurtrie, 2018). The VCCS has a Pell Grant rate of around thirty-four percent, based on SCHEV data from 2017-2018 (SCHEV, n.d.). In the entire VCCS, approximately thirty-six percent of students are non-white, and about twenty percent are first-generation college students

(VCCS, 2017). Georgia State loses between ten and twenty percent of their students to summer melt each year, with higher rates for these primarily non-white and first generation populations (Page and Gehlbach, 2017). Pounce, Georgia State's chatbot, successfully reduced melt by twenty percent in its first year of implementation, with larger use among first-generation students for financial aid tasks (Page and Gehlbach, 2017). This impact, especially for first-generation students, provides a support beyond the office or classroom which can greatly improve the student experience.

AI has the potential to assist schools with enrollment and retention. Georgia State University has a high percentage of students who are at risk of non-enrollment or non-completion. Pounce has directly impacted student access and opportunity to higher education. The chatbot increased equity as those with higher risk, such as first-generation students, have made more use of the tool than those without that risk factor. According to Kim (2018) of Inside Higher Ed, only about six of 10 students will be at the same institution by next year.

How can the retention be improved across all colleges in the VCCS? Artificial intelligence can assist greatly by collecting student interaction data from an astounding number of sources and then utilizing the data to "learn" about which students are at risk of not staying enrolled/re-enrolling (Kim, 2018). For example, artificial intelligence can determine the pass/fail rate of numerous courses, show the geographic areas in which students withdraw from the most, which off-campus locations have the best student success, and how often students visit tutoring/library, etc. AI can form algorithms and patterns to determine the "good" behavior of a well-performing student and then relay the information to counselors, advisors, faculty, deans, etc. The faculty/staff can then create orientations or other similar programs to ensure all students are on the path for success. In addition, artificial intelligence will also be able to alert

faculty/staff members if a student is in danger of withdrawing much more quickly than traditional advising meetings. While artificial intelligence for retention may take a while to develop, the benefits of the software will be substantial.

ACE: NVCC's AI Assistant

Within the VCCS, Northern Virginia Community College recently implemented the use of AI. "Ace," the NOVA nighthawk chatbot, has been introduced on the NVCC website. The institution has seen some amazing usage numbers which provide a baseline for system-wide implementation, with individual colleges customizing the "bot" to fit their students' needs. In the first three months, December through February, ACE has provided answers to users over 1,200 times (Apendix A). The highest volume of usage occurred within the peak registration window, the week before the start of classes and the first two weeks of classes in a semester (Appendix A). ACE uses information input via content managers and cross references it with information it can find via the NVCC website. For example, if a user wanted to know how to register for classes, ACE will provide the student with those steps.

ACE is constantly improving and learning. This is shown in the breakdown of the monthly interaction statistics NVCC has provided. ACE's knowledge-based responses have increased each month while the, "I don't know" responses to user requests has decreased. ACE provides NVCC with the opportunity to help more students who may not otherwise step foot on campus (Appendix B). If ACE does not know an answer or cannot find an answer, he will refer the student to the make a connection with someone at the college. ACE's ability to answer some of the routine questions has cleared time for NVCC employees to provide even greater service

for students who enter the offices on the campuses of the institution, improving the overall experience for students both on and off campus.

CONCLUSION AND FUTURE IMPLICATIONS

Artificial Intelligence has the ability to immediately impact the student experience with regard to the area of student affairs. According to Olawale (2019), "Chatbots are great tools to communicate with customers. With the feedback they collect through simple questions, you can make improvements on your services/products, you can also get them to track patterns and behaviors by monitoring user data." AI can help potential students with completing the steps to enrollment. Current students will benefit from AI through its power to send students reminders about important dates. AI can tell students which classes are necessary for completion of their program while also letting the student know if those classes are being offered. Completion of the FAFSA, which is a major barrier to potential and current students, can be increased through the use of AI. Beyond the student experience, AI can help the institutions with preparation for coming semesters and communication plans.

Future implications include using artificial intelligence to aid in instruction. AI can be used by instructors who teach brick and mortar classes to take detailed notes which can be placed online for student use. This can help minimize the number of students who withdraw from classes because of missed classes. There is the potential for using AI to connect students who take advantage of eLearning opportunities to be more engaged with advising and other resources.

As far as implementation within the VCCS, costs can be a factor. FATV has given a ballpark quote of about $385,000, or about $17,500, for the other twenty-two VCCS schools to join NOVA. This includes GetAnswers videos (the basic FATV) and the financial aid chatbot. This price is comparable to that of other AI being used in higher education. According to Page and Gehlbach, Pounce costs between $7 and $15 per student (2017). The use of AI can only be limited by the imagination of the ones who dare to use it.

REFERENCES

Cheston, A. and Stock, D. (2017, June 5). *The AI-first student experience. EDUCAUSEreview*. Retrieved from https://er.educause.edu/articles/2017/6/the-ai-first-student-experience.

Gardner, L. (2018, April 13). How A. I. is infiltrating every corner of the campus. *Chronicle of Higher Education*, 64(31), 1-1. Retrieved from https://www.chronicle.com/article/How-AI-Is-Infiltrating-Every/243022

Kim, J. (2018, November 14). *Artificial intelligence and retention*. Retrieved from https://www.insidehighered.com/digital-learning/blogs/technology-and-learning/artificial-intelligence-and-retention

McMurtrie, B. (2018, May 25). Georgia State U. made its graduation rate jump. How? Retrieved February 8, 2019, from https://www.chronicle.com/article/Georgia-State-U-Made-Its/243514

Olawale, W. H. (2019, February 25). *chatbotslife.com*. Retrieved 2019, from: https://chatbotslife.com/5-benefits-of-using-a-chatbot-937b8b793826

Page, L. C., & Gehlbach, H. (2017). How an artificially intelligent virtual assistant helps students

navigate the road to college. *SSRN Electronic Journal*, 3(4), 1-12.

doi:10.2139/ssrn.2940297

ABOUT THE AUTHORS

Mandy Barrett is Coordinator of Recruitment and Student Engagement at Southwest Virginia

Community College.

Lisa Branson is a Financial Aid Manager at Northern Virginia Community College.

Sheryl Carter is an Accounts Payable Specialist at New River Community College.

Frank DeLeon is a Coordinator of Student Success at Northern Virginia Community College.

Justin Ellis is a High School Career Coach at J. Sargeant Reynolds Community College.

Cirrus Gundlach is a Coordinator of Library Services at Paul D. Camp Community College.

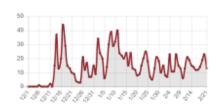Dale Lee is a Student Leadership and Disability Counselor at Mountain Empire Community

College.

APPENDIX A

FATV Chatbot – Analytics
Start date: 12/01/2018 – End date: 02/22/2019

Conversations (All-Time)

1,204
2,861 interactions

Conversations Per Day

APPENDIX B

APPENDIX C

Data from https://admin.fatv.us/admin/analytics/dashboard, 2/22/2019