Early Intervention for At-Risk Online Students

Carolyn Andrews
carolyn_andrews@byu.edu

Follow this and additional works at: https://scholarsarchive.byu.edu/ipt_projects

BYU ScholarsArchive Citation

This Design/Development Project is brought to you for free and open access by the Instructional Psychology and Technology at BYU ScholarsArchive. It has been accepted for inclusion in Instructional Psychology and Technology Graduate Student Projects by an authorized administrator of BYU ScholarsArchive. For more information, please contact scholarsarchive@byu.edu, ellen_amatangelo@byu.edu.
Early Intervention for At-Risk Online Students

Carolyn Andrews, MS

Design & Development PHD Project Report
Instructional Psychology & Technology, Brigham Young University
June 18, 2019
PRODUCT DESCRIPTION

Purpose

Brigham Young University (BYU) is a private, non-profit research university sponsored by the Church of Jesus Christ of Latter-day Saints. The mission of the university “is to assist individuals in their quest for perfection and eternal life. That assistance should provide a period of intensive learning in a stimulating setting where a commitment to excellence is expected and the full realization of human potential is pursued” (Brigham Young University, 1981, BYU Mission Statement, para. 1). To this end, one aim of a BYU education is to help students develop lifelong learning habits. Learning in the 21st century is supported through online delivery.

The purpose of this project was to design and develop an intervention for at-risk students enrolled in an online class at Brigham Young University. The overarching goal of creating an intervention was to facilitate online learning and improve student satisfaction by helping students increase their performance. Development of the intervention was done in coordination with BYU Online administrators and select BYU faculty.

Learning Objectives

The primary outcomes for this project include:

1. Design and develop at-risk student progress monitoring and intervention processes for the BYU Online program.
2. Implement monitoring and intervention processes (e.g., identify at-risk students, sending emails, text messaging) performed by the BYU Online program for each online course throughout the semester.
3. Evaluate the process, reflect on the learning and make appropriate data-driven changes to the intervention.

Background and Rationale

Brigham Young University President Kevin J. Worthen’s Online Learning Initiative is that by 2020, entering Freshman “can take at least fifteen hours of credit online before graduation” (Worthen, 2017). His vision is to help students develop 21st century learning skills, critical skills students will need to succeed in learning, work and life (Webb, 2016). To understand whether today’s cadre of students have the attributes necessary for success in the 21st century, studies have revealed that successful students possess a mix of proficiencies that enable them to excel in work and life in the 21st century (Carroll, 2007; Burmack, 2002; Riddle, 2009; Frey & Fisher, 2008; Trilling & Fadel, 2009). The Framework for 21st Century Learning (Partnership for 21st Century Skills, 2011) was developed with input from industry leaders in teaching, education experts, and business, a framework for 21st century learning, and have been broadly described as the outcome of 21st century learning and include proficiency in 4 key areas: creativity, communication, collaboration and critical-thinking.

So critical are these proficiencies, skills, and outcomes that Milton Chen said, “The Internet, which has enabled instant global communication and access to information, likewise holds the key to enacting a new educational system, where students use information at their fingertips and work in teams to accomplish more than what one individual can alone, mirroring the 21st-century workplace” (2010, para. 9). Finding ways to help students develop these proficiencies is paramount.
Despite the caliber of students on BYU’s campus, though bright and accomplished, some lack the skills necessary to successfully learn online. Furthermore, due to their overachieving status, they may resist enrolling in an online course to avoid perceived failure. Unfortunately, such students will miss out on the opportunity to develop the 21st century learning skills necessary for remaining competitive in the 21st century and to be a lifelong learner, one of the aims of a BYU education and motives of President Worthen’s BYU Online Initiative (Webb, 2016).

This lack of preparation is disconcerting to faculty who are teaching online classes and have ill-prepared students for the learning environment. Determining how students can prepare for this learning environment is a complex question that will require focus from both researchers and practitioners. Without an intervention, little is likely to change for these students and increase the frustration of BYU faculty. Furthermore, President Worthen’s Online Initiative will not be completely successful.

**Audience**

The primary target learners for this design project included:

- At-risk students enrolled in a BYU Online course. Based on the literature review and small pilot data, before a semester/term begins, students enrolled in BYU Online courses who meet one or both of the following criteria were identified:
  - Class Standing: Freshmen or Sophomores
  - Academic Standing: Not in “Good” standing (i.e. Warning, Probation, Suspension, or Continued Academic Probation)

In addition to the at-risk students, additional audiences were considered in the design. These audiences were not heavily included in the learner analysis but were represented in the design
evaluation processes, and attention was also paid to their ability to access the materials created as part of this project. The additional audiences included:

- Faculty and adjuncts teaching the BYU Online courses.
- Teaching Assistants associated with the BYU Online courses.
- BYU central administration responsible for the learning at BYU.

**Product Summary**

The intervention was developed to facilitate the learning outcomes of this project. Its intent was to be deployed with identified at-risk students enrolled in BYU Online classes offered at Brigham Young University. At-risk students are identified as Freshmen or Sophomores who were not in “Good” academic standing (i.e. Warning, Probation, Suspension, or Continued Academic Probation). Proactive steps to intervene before a student falls behind in the course were outlined. Implementation of email or text messaging to invite the student to follow-through with the recommended intervention was described in detail. Reference the design process for detailed descriptions of the steps and implementation.

**Design Process**

**Clients, Stakeholders, and Background**

The direct clients for this project were the following individuals, all who are employees of Brigham Young University (BYU):

- Carolyn Andrews, BYU Online Program Administrator
- Kirk Parry, BYU Online Courses Administrator
- Laura, McAllister, BYU Online Courses Administrator
BYU Online is responsible to institute student progress monitoring and intervention processes for each online course throughout the semester, utilizing assigned BYU professors and/or TAs, where applicable. See Appendix A for the full BYU Online team, and their associated roles at BYU Online and in this project.

Other Stakeholders included the following:

- Students
- Faculty
- Teaching Assistants
- Division of Continuing Education Dean’s Office
- BYU Central Administration

BYU’s central administration, Division of Continuing Education, Faculty and associated teaching assistants are heavily invested in the success of students. See Appendix B for the full environmental analysis.

**Planning**

Conversations with clients and stakeholders identified the following priorities for this project:

- Identify which student population is at-risk.
- Identify a strategy for intervention.
- Develop the intervention - including messaging that will be sent to the students.
- Pilot the intervention.
Analysis

Based on the priorities set for this project, a learner analysis was conducted for this project. This phase included:

- **Identifying who the audience is.** BYU has the largest undergraduate enrollment of any private university (“Facts and Figures,” 2019). The Freshman profile included the following information:
  - 13,707: applicants
  - 53.4%: admittance rate
  - 5,440: total new freshmen
  - 29.5: average ACT score
  - 3.86: average high school GPA

- **Understanding what the audiences’ knowledge of the subject is.** We found that this would depend on the nature of the course the student is enrolled in. The course could be a general education class, or a course to fulfill a major requirement. However, from a broader perspective - many of our students have no previous experience with online learning and how to be a successful online student.

- **Understanding the demographics of the audience.** Based on accessible university information, there are 30,693 undergraduate students of which 52% are male and 48% are female.

- **Why is the audience involved in the intervention.** The premise of the intervention is that the audience would be involved because they are at-risk and have fallen behind according to benchmarks. The intent of the intervention is to help them stay on track and learn the skills to be successful in an online course.
• **How will the intervention be deployed.** Once the audience meets one or more of the benchmarks, they will be contacted via text message or email. Students want quick and easily digestible information. Not text heavy.

• **What should the audience gain from the intervention.** The audience should expect to learn specific strategies they can implement to help them succeed in a limited amount of time.

A full report of the analysis and its findings can be accessed in Appendix C.

### Design & Development: Intervention

#### Theory

Developed by Bandura (1986), Social Cognitive Theory (SCT) was the framework used for this intervention. This theory posits that individuals are active agents who both influence and are influenced by a dynamic and reciprocal interaction of their social environment. One major component is the process of learning by observing then modeling those behaviors to maximize the intended outcome. Whether or not an individual models those behaviors is influenced by their belief in their own self-efficacy.

#### Iterative Phases

This project was developed in the following 3 iterative phases:
**Phase 1:** Development of the intervention informed by existing intervention strategies and technological innovations. This was done through a literature review of retention and interventions which then iteratively led to identifying at-risk students. (See Appendix D for Annotated Literature Review)

**Phase 2:** Identify if an algorithm will be used to identify at-risk students. Kirk Parry, data analyst, led out in this phase. Based on the literature review and team discussion, it was determined that all students enrolled in BYU Online courses would be invited to opt-in to the intervention.

**Phase 3:** Prepare step-by-step methodology to execute intervention. This was a team effort. Laura McAllister, faculty and TA trainer, led out in creating content to push to students. Messaging was iterated and included asking BYU students about their preference.

**DESIGN EVOLUTION & FORMATIVE EVALUATION**

**Design Evolution**

**Stage 1: Signals for Intervention**

Based on literature reviews, our team came up with events that signal need for intervention.

Those signals were:

- Low grade in course (C or below)
- Student has not logged into course for a week
- Student has low page views or participations relative to the rest of the class

**Stage 2: Intervention Type**

Once the signals were established, our team decided on associated interventions. Those interventions were:
<table>
<thead>
<tr>
<th>Student in need of intervention</th>
<th>Intervention type</th>
</tr>
</thead>
</table>
| Student has a low grade in the course | ● Send an email with tips for online learning to student  
● Encourage the student to reach out to their TA and/or professor  
● Send list of students who have a low grade in the course to the TA/instructor |
| Student hasn’t logged into the course in a while | ● Send a reminder email to the student to regularly check the course (talk about the need to check for announcements, studies that show successful online learners log in often, etc)  
● Send list of students who have not logged into the course in a while to the TA/instructor |
| Student has low page views or participations relative to the rest of the class | ● Send an email with online learning best practices, encouraging participation to the student  
● Send list of students who have low page views or participations relative to the rest of the class to the TA/instructor |
Stage 3: Tips

Tips will be sent out four times during the semester/term, as follows:

**First Tip**
- The day after the add/drop deadline, send the following message to all participants:
  - Emails will have the subject line, “BYU Online Tips”

**Email**

Dear Student,

Here are three online learning tips to help you start the term right:

1. Map out important dates early (due dates of major assignments, exams, etc.).
   - You can set up calendar notifications in Canvas [read how here](https://community.canvaslms.com/docs/DOC-10624).

2. Be sure to stay on schedule. One way to do this is by logging in daily.

3. You likely already read the course syllabus, but it’s helpful to read it again to make sure you didn’t miss anything.

- BYU Online

**Text Message**

Here are 3 online learning tips to help you start the term right: 1. Map out important dates early (due dates of assignments, exams, etc.). Set up calendar notifications in Canvas (read how here: https://community.canvaslms.com/docs/DOC-10624). 2. Stay on schedule as summer term moves quickly. Logging into your course daily helps you do this. 3. Read the syllabus carefully. -BYU Online

**Second Tip**
- Know to get help
  - Canvas tip: Know how to reach out to TA: [https://community.canvaslms.com/docs/DOC-10573-4212710324](https://community.canvaslms.com/docs/DOC-10573-4212710324)
  - Use Canvas to email your TA when you have a question or concern about the content, an assignment, an exam, etc. If you don’t ask for help when you need it, you may fall behind, and that could be problematic. When you have a problem contact your TA or professor immediately. Don’t wait for them to reach out to you, they may not know that something is wrong.
Third Tip

Email
Get ahead—start working on big assignments today! For some motivation, watch this short TED talk:
https://www.ted.com/talks/angela_lee_duckworth_grit_the_power_of_passion_and_perseverance

-BYU Online

Text Message
Get ahead—start working on big assignments today! For some motivation, watch this short TED talk:
https://www.ted.com/talks/angela_lee_duckworth_grit_the_power_of_passion_and_perseverance -BYU Online

Fourth Tip

● Study tips
  ○ Research suggests that students are more successful when they form study groups. You can do this by asking classmates in a discussion group, emailing the entire class through Canvas, or talking with your teacher about sending out a sign-up. You can use tools like Google Docs or Zoom to collaborate and communicate. Go to: byu.zoom.us and log in with your Net ID and password to start a video conference with others.
  ○ Teach them how to reach out to their peers to organize study groups
  ○ Teach them how to use Zoom to meet remotely
  ○ Aristotle wrote – “Teaching is the highest form of understanding.”

Fifth Tip

Finals Study Tips:

Create your own study guide, ask your TA/Professor Questions, Attend the review session, study group, quiz yourself. Teach/Explain the concept to someone.
(https://www.princetonreview.com/college-advice/5-study-tips-for-finals)

Canvas Student Guide:
Tips for Online Learning

10 tips to help you be successful in your online course

Start early
From the first day of class read the syllabus, find your books, get to know the professor and TA(s), familiarize yourself with expectations, and get to work early. Learn Canvas and set up notifications.

Map out important dates
At the beginning of the semester, put all the due dates in your calendar and set reminders that give yourself enough time to complete each assignment.

Stay on schedule
Know the deadlines and meet them. Start major assignments early. Speak with your professor promptly if you have extenuating circumstances. Fight the urge to procrastinate.

Dedicate a place to study
Try to work on your online course in a quiet place where you won’t be interrupted. Avoid social media and other distractions. Schedule brief breaks to maximize your energy and ability to concentrate.

Netiquette
Be respectful of others and aware of how your statements might be perceived. Proofread your work before you submit it and DON’T USE ALL CAPS.

Know how to ask for help
Reach out to your professor and/or TA(s) if you are confused or are falling behind. Avoid waiting to ask for help until it’s too late.

Stay motivated
Set goals, speak with your professor and/or TA(s) when your performance doesn’t match your expectations, and maintain good habits. Have grit.

Check in daily
Log into Canvas daily to check for announcements, inbox, or changes to the syllabus. Students who check in regularly tend to be more successful online learners.

Make your online course a priority
Your online course should take as much time as a face-to-face course. A three credit hour course should equate to nine hours of work per week.

Be connected
Get to know your professor, TA(s), and classmates. Students are more successful when they feel connected and that others are invested in their success.
Stage 4: Notifications

Once the type of intervention was established the implementation schedule was established.

Notifications

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Timing</th>
<th>Type of Notification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Every Week</td>
<td>Mondays</td>
<td>● Grades (only send once per semester); start at week 6 during semester</td>
</tr>
<tr>
<td></td>
<td></td>
<td>○ 10% or lower than class avg.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>● Login reminder</td>
</tr>
<tr>
<td></td>
<td></td>
<td>○ Full week of no login (since prior Monday)</td>
</tr>
<tr>
<td>Every other week</td>
<td>Every other Monday</td>
<td>● Low page views</td>
</tr>
<tr>
<td></td>
<td></td>
<td>○ 25% of class avg. from past 2 weeks</td>
</tr>
</tbody>
</table>

Rules

- Only send up to one notification per week. Hierarchy as follows:
  - Grades, login, low page views
- Only send the grades notification once per semester

Stage 5: TA Protocol

This intervention relies on accurate data. In order to send the right notifications at the right time, TA’s will need to be sure to do the following:

- Each week change Canvas default dashes with zeros so student grades update
- Email all students who didn’t turn in assignments
- Reach out to high scoring students and commend them for their efforts
- Invite students to attend virtual labs. Don’t wait for students to show up. “I noticed you didn’t do so well, I’m available ... let’s meet. Help explain concepts they’ve missed”
- Be proactive
- Host a review before tests or a Q&A before major papers/assignments
- Record an info session before big assignments - hey this is what I’m expecting etc...
- Respond to emails within 24 hours
- Grade assignments within 1 week of submission
- Check Canvas course and student analytics regularly
- Track students who haven't logged into the course in a few days and message them

**Stage 6: Formative Evaluation Notifications Research**

**Notifications Survey**

On October 11, 2018 three BYU Online employees went to the Wilkinson Center and offered students a donut in return for taking a survey that was designed to evaluate notification messages for:

- low grade
- low page view
- login reminder
- a few additional questions aimed at determining student preferences

Students were given instructions, options to choose from (including the currently used messaging) and the ability to create their own suggested messaging. A full report can be found in Appendix E.
Product Implementation

Invitation to participate
Before a semester/term begins, identify students enrolled in BYU Online courses who meet one or both of the following criteria:

- Class Standing: Freshmen or Sophomores (Class standing was determined on second iteration)
- Academic Standing: Not in “Good” standing (i.e. Warning, Probation, Suspension, or Continued Academic Probation)

After these students are identified, send them an email invitation survey to participate in a program involving tips for online learning as well as notifications if it appears they may be falling behind. Invitation survey can be found in Appendix F.

Pilot
Our team executed the intervention during Spring term 2018 since BYU Online offered fewer classes. The intervention was implemented according to plan.

Evaluation Plan
After the semester, send out a survey to students to find out how effective they felt the notifications were. Based on our findings, we will be able to decide how to proceed. This will likely involve iterating a few more semesters. Once confident in our findings, execute with other universities to study generalizability of the intervention. (See Appendix G for a complete report of survey results)
Evidence

At the beginning of each BYU Online course, students complete a Learner Readiness Survey (LRS). The results were used as part of the summative evaluation. Additionally, students were asked about the motivation to take the online or blended class they were enrolled in. (See Appendix I for a complete report of results)

Spring 2018 Survey Results

The students who benefited most from the interventions didn’t respond to the survey. Students who were not at-risk (junior & seniors in good academic standing) did not seem to benefit from the interventions—indeed, based on the following feedback, they may have been more of a nuance than help for this group.

Outcomes

Results from spring are encouraging but summer tells a different story. Ultimately we need a larger sample size to be able to have enough statistical power to control for potentially confounding variables.

We also determined we needed notification messaging feedback from BYU students. We added a stage to the design (stage 5 above) and included the results there.
Reflection and Critique

Lessons Learned

Among the myriad of lessons learned, including strengths, here are my top choices:

- **Literature reviews** are important to frame your design. Knowing what others have previously discovered is valuable ground already covered. It helps prevent unnecessary error.

- **Understanding what other professionals are doing** is important. Not everyone publishes their research. Making connections with others and learning from their experience is another way to make progress in your design. Since finishing this project, I had the good fortune of attending a conference where I learned about what other institutions were doing to help their students succeed. Once such university created a mobile app to send push notifications to students ([https://boost.education/](https://boost.education/)) to remind them of unsubmitted assignments due dates, daily assignment digest, announcements and calendar events. This solution is ideal for the population we are serving.

- Interestingly, **not every student wants to succeed**. Some are quite happy to just flounder. Passing an assignment, quiz, and exam is good enough - as long as they pass the class. I need to let that roll off my back. I can’t fix everyone especially when they don’t think they are broken.

- **There is a lot of pre-design work** that goes into a design project. Taking time to plan and organize yourself will pay great dividends. Keeping meticulous notes will help remind the research team decisions that were made and why they were made. Project management skills are a must. See Appendix H for budget and timeline.
- **Teamwork is important** - but getting schedules to work together is challenging. There is no “I” in team. The best projects include other people. Different perspectives are enriching and ultimately creates a better project. The diversity in the group created a stronger product.

- **Identifying stakeholders is complex.** Before you can work with them, you need to know who they are. In this project, we didn’t do a great job at including all our stakeholders in the design. Doing so would have taken an inordinate amount of time but would have produced a better product.

- **The power of positivity.** I learned that I can do more than I think I can. I often short change myself. I have great ideas and a strong work ethic. I can accomplish great things.

- Running a small pilot helped us see **where to improve.** Regardless of the small sample size, we did receive valuable feedback which led to great improvements for our larger roll-out.

### Weaknesses and Limitations

Among the many weaknesses and limitations, here are a few of the more notable:

- **Everything always takes longer than you think.** When working with humans there are inherent limitations. For example, it takes time to communicate your goals. They need to be understood by the group. Teamwork requires building a relationship. This takes time. There are misunderstandings. Those corrections take time and often require additional relationship building. Defining the scope of the intervention took a considerable amount of time.
• **Small sample size.** Because we ran a soft pilot in spring and summer terms, our sample size was lower. Ultimately we need a larger sample size to be able to have enough statistical power to control for potentially confounding variables. Our plan is to implement the improved intervention Fall 2019.

• **Didn’t do any UX testing before pilot.** After we conducted UX testing in the Wilkinson Center, we ended up with better messaging. Of course this makes sense; we asked our stakeholders.

Creating the design and developing the intervention was a rich and rewarding experience. Looking back, I have been able to see how our original plan looks nothing like the final product. It is important to remember not to have blinders on. Allow time to iterate - which takes patience, time and money. This project has provided me with experience to be flexible enough to adapt and change. See Appendix I for link to product (intervention) walkthrough.
## Appendix: Guide to the Artifacts

<table>
<thead>
<tr>
<th>Appendix</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appendix A: Project Team</td>
<td>Introduction to team members and description of their role and responsibilities.</td>
</tr>
<tr>
<td>Appendix B: Environmental Analysis</td>
<td>The analysis entails assessing the level of threat or opportunity the factors might present.</td>
</tr>
<tr>
<td>Appendix C: Learner Analysis</td>
<td>Identifies who our audience is; their demographics, prior knowledge, physiological and affective and social needs.</td>
</tr>
<tr>
<td>Appendix D: Annotated Bibliography</td>
<td>This annotated bibliography is a list of citations to articles that informed the team of the relevance, accuracy, and quality of the sources cited as it pertains to the clients intervention.</td>
</tr>
<tr>
<td>Appendix E: Formative Evaluation Research Report</td>
<td>This section gives a full report on the data collected from students on the preference of messaging and type of notification.</td>
</tr>
<tr>
<td>Appendix F: Invitation Survey</td>
<td>Sample of the invitation survey used to invite participants to opt-in.</td>
</tr>
<tr>
<td>Appendix G: Summative Evaluation - Instrument</td>
<td>Results from survey student participants completed at the conclusion of the pilot.</td>
</tr>
<tr>
<td>Appendix H: Project Management</td>
<td>The process of creating a budget to operate within and a timeline to complete the project.</td>
</tr>
</tbody>
</table>
### Appendix A: Project Team

In order to get the job done efficiently and correctly, the team will be composed of the following:

<table>
<thead>
<tr>
<th>What</th>
<th>Who</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>PI, Researcher</td>
<td>Carolyn Andrews, PhD candidate</td>
<td>To organize, design and execute the intervention with team from BYU Online. Responsible for the vision and overall plan and execution of the project. In conjunction with the BYU Online team, will also make general recommendations about the effectiveness of the learning approach or other generalizable aspects of the project. The PI is the researcher.</td>
</tr>
<tr>
<td>BYU Online Team Member</td>
<td>Laura McAllister</td>
<td>Help develop intervention strategies and weekly communication.</td>
</tr>
<tr>
<td>BYU Online Team Member/Data Analyst/Evaluator</td>
<td>Kirk Parry</td>
<td>Identify at-risk students. Assist with data collection/analysis. Evaluate and measure the project's impact, as well as other outcomes and outputs, intended or unintended.</td>
</tr>
<tr>
<td>Administrative Assistant/Project Manager</td>
<td>Elizabeth McIntire</td>
<td>Administrative duties. Project Manager oversees the day-to-day operations, milestones, budget and reporting requirements of the project.</td>
</tr>
<tr>
<td>Student Research Assistant</td>
<td>Rachel Sherman</td>
<td>Assist with data collection. Send out intervention communication to at-risk students. Help monitor the data collection.</td>
</tr>
</tbody>
</table>
Appendix B: Environmental Analysis

This intervention will be administered through the BYU Online office on Brigham Young University’s campus, in Provo, Utah.

Stakeholders

Ultimately, central administration is the stakeholder. However, faculty who are teaching and students taking online classes would also be included.

Constraints

- 15 week semester/7 week term
- Limited access to student data
- Budget
- Size of research team
- Volunteer to participate in study

Limitations

- BYU student population is an exceptional student population. Generalizability of findings will be difficult.
- Students are not required to take online classes right now. There will be little opportunity for collecting longitudinal data to see improvement over time.
- Faculty buy-in.
- At-risk students do not always want or seek assistance.
- Some students do not care about the grade they earn in the online class. They need the course to graduate and are taking the path of least resistance.
- Due to the limitations of self-report measures, it is difficult to verify if an at-risk student actually followed-through with the intervention recommendations.
# Appendix C: Learner Analysis

<table>
<thead>
<tr>
<th>Analysis – Who is the audience?</th>
<th>BYU has the largest undergraduate enrollment of any private university (“Facts and Figures,” 2019).</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Freshman Profile</strong></td>
<td>13,707: applicants</td>
</tr>
<tr>
<td></td>
<td>53.4%: admittance rate</td>
</tr>
<tr>
<td></td>
<td>5,440: total new freshmen</td>
</tr>
<tr>
<td></td>
<td>29.5: average ACT score</td>
</tr>
<tr>
<td></td>
<td>3.86: average high school GPA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Understanding – What is the audience’s knowledge of the subject?</th>
<th>This depends on the nature of the course the student is enrolled in. Could be a general education class, or a course to fulfill a major requirement. From a broader perspective - many of our students have no previous experience with online learning and how to be a successful online student.</th>
</tr>
</thead>
</table>

| Demographics – What is their age, gender, education background etc.? | 30,693 undergraduate students |
| | 52% male; 48% female (“Facts and Figures,” 2019). |

| Interest – Why are they involved in this intervention? | They would be involved to help them stay on track and learn the skills to be successful in an online course. |

| Environment – Where will this intervention be sent/viewed? | Via text message or email. |

<p>| Needs – What are the audience’s needs associated with your intervention? | Students want quick and easily digestible information. Not text heavy. |</p>
<table>
<thead>
<tr>
<th><strong>Customization – What specific needs/interests should you the writer address relating to the specific audience?</strong></th>
<th>This population is exceptionally bright and have a track record of academic success.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Expectations – What does the audience expect to learn from your intervention?</strong></td>
<td>They expect to learn strategies to help them succeed in a limited amount of time.</td>
</tr>
</tbody>
</table>
Appendix D: Annotated Bibliography

Retention/Interventions

This article analyzed the factors that make a student more likely to drop out of an online course and then analyzes conditions of student retention and ways that online distance learning can be most successful. This is broken up into two categories: factors to be implemented for students who are new to the program, and strategies in promoting communication and problem solving for students to aid in retention. The article then analyzes “learner support services”, or programs designed to aid in student retention and intervention such as a toll-free careline, online support via social media, and regional support and learning centers. The causes of issues in student retention are divided between internal (academic support, administrative support, social support and others) and external (family and work related issues posing a tremendous challenge) factors and recommendations for support in each category are given.


The study described in this article focuses on student success in online learning environments and examines several variables, such as the amount of time a student watches instructor-made videos, the nature of communication between the student and instructor, and the amount of time spent on completing the online assignments and exams that lead to increased student retention. Short concise instructor-made videos contribute to student’s success (as opposed to lecture videos over about 15 minutes), and consistent subject-related communication between the instructor and the student also positively affects students’ performance.


The purpose of this article is to present a formative Intervention plan for students dealing with issues in relation to their online learning courses, specifically targeted to enhance students’ situational interest, perceived utility and self-efficacy. The Interventions are overall designed to increase students’ motivation regarding their work in online courses. The model outlined in the article centralized around reports on interventions designed to enhance aspects of motivation, described as the Attention, Relevance, Confidence, Satisfaction (ARCS) model of motivational design. The model suggests that students’ level of effort is determined by his/her curiosity (or Attention), perceived Relevance to the course material, and Confidence for successful learning. The article outlined different strategies to helping students improve in each of these theories,
and then described a study in which students were tested in three categories: online treatment, online control, and face-to-face control. They measured levels of interest using the Course Interest Survey, which is based on the ARCS model. Students in the treatment group received mass emails every two weeks, composed based on the ARCS model to attract attention and convey personal interest in learner success; to remind of student personal control and reinforce confidence and satisfaction by giving students knowledge of what was expected of them. They also included words of support and encouragement, and points of contact for instructor availability. The results from the study showed a lot of improvement from the control and treatment groups, and demonstrated similar results between the face-to-face group and treatment group.


This article outlines a plan of student online learning retention and intervention for students who are struggling or at-risk. The optional, student initiated support plan, called ‘SOS’, involves five-steps that help students receive scaffolding instruction, learning support and academic coaching to help in times of stress or when problems or issues arise. The steps are to first ask/request to receive the introductory guide and scaffolding, second, answer an SOS planning questionnaire (for helping identify specific issues and problems to be addressed), third, receive academic coaching/scaffolding and individual feedback, fourth, receive an SOS map and mp3 that will help map out success, and fifth, SOS Scaffolding/coaching sessions in the discussion area of the course. The program was optional for students, but the students that went through the program reported great success in engaging and benefitting from community building, individualized education plans, organization skills, study skills, tech skills, and group collaboration skills.


This article is focused around the explanation of the U-Pace Instructional intervention program that utilizes an online learning environment to integrate content mastery with Amplified Assistance (instructor-initiated, individually tailored feedback on concepts not yet mastered and constructive support that every student receives via email weekly or as often as needed.) to tailor coaching of student learning based on students’ strengths and motivation. The study followed the progress of students participating in the U-Pace course versus student in conventionally-taught courses, and the results showed a significant increase and improvement in performance for the U-Pace course students. Some of the specified positive impacts of the U-Pace course was that student academic success improved, students improved in the rate of content mastery, perceived control over learning and sense of achievement improved, perceived
improvement in time management and study skills improved, and student motivation increased. The results of the study demonstrated and supported these claims, showing that the implementation of U-Pace would be a definite asset to improving retention and Interventions among student online learners.


This article mainly focuses on the actions taken to help identified at-risk students. A group of researchers trying to determine the most effective interventions and retention programs tested a couple of groups of students and recorded data while they went through a series of video watching, collaborative programming, discussion, and a refine program. One group was tested with learning analytics, and one without. Strategies of intervention included internet-based notification and face-to-face discussion. Analyzing the students learning behaviors and their responses to the course can help instructors and administrators know exactly when to arrange an intervention. Once an instructor is notified of an at-risk student, they can promptly notify the student and create specialized and direct interventions for helping them.


This article mainly focused around the study and implementation of ‘Self-Regulated Learning’ in academic settings; the history of it in learning environments, the ways that it is currently being implemented, and the future of it in a variety of environments in educational institutions around the world. According to the article, self regulated learning is a process that involves students' intentional efforts to manage and direct complex learning activities toward the successful completion of academic goals, and key processes that affect learning outcomes include goal setting and time management, self-monitoring and reflection, modification of learning strategies, regulation and feedback, help seeking, and resource oriented learning. Within each of these stages, the processes are structured into four areas, cognition, motivation, behavior, and context. Academic outcomes were measured on four different levels of problem solving by means of representing the problem, developing solutions, making justifications, and monitoring and evaluation. Some specific methods that the program includes are reflective question prompts, different requirements for logging into a course (prompted to record the starting time, place they
studied, person(s) with whom they studied, and then predict their score on a post lesson quiz and adjust time spent on lesson materials in order to improve their score).


The purpose of this article is to analyze and describe a model of intervention which includes learners’ learning status identification, intervention strategy matching and calculation, intervention application and intervention effectiveness analysis. The basis of the Learning Intervention strategy is on identifying students at-risk by methods of learning analytics. The article includes ideas from multiple universities and online programs using different methods of collecting data about student progress (ie LMS, CMS, OAAI, OASE, AAR) and then presents a format of how the typical intervention strategy is layed out. They describe how existing researches and intervention programs use a traditional instructor-student approach, where they reach out to students on an individual or one on one basis as a means of communicating the information directly to them (reminders, bonuses and pushing information). Collectivised interventions include standardized tests, resources, process guidance, knowledge map, etc. The main discussion of the article is a new ideas surrounding interventions where a perpetual cycle of the workflow is broken up into four main phases: Learning Management System (E-textbook, question and answer, digital learning resource, assignment and exam), Identifying Learners strategies (specifically using learning analytics), implementing specific intervention strategy that matches the status of the student, and matching a strategy to their needs (visualizing learning progress, pop-up window, sending emails, and page pushing for example). Students’ progress data includes learners’ learning progress data, learners’ knowledge construction data, learners’ learning ability and level data, learners’ learning trials and features. (four dimensions: learning behavior data, learning emotion data, learning network data, and learning level data). Specifically for the different intervention types, the content includes: 1)Visualizing learning progress (completeness of learning goals, learning path, network relationship, learning advice and guidance) 2) Pop-up window (announcement and notice, warning information, learning advice and guidance) 3) Sending Emails (periodic learning summary, learning plan, learning material, learning arrangement) 4) Page pushing (learning partners, teacher dialogue, Learning materials and learning tools).


This article mainly described and analyzed the relationship between notifications we receive on our phones every day and our responses to them to notifications we might receive from an online
learning program. The article presents specific things to focus on when taking this approach that allow students to have meaningful and engaging learning experiences through the online learning programs and the formats by which they are presented. Interactive notifications can have a dramatic effect on learners as they receive constant support and encouragement though badges that connect them to the learning experience. When the content of the learning experience is fun and engaging and the badges and notifications connect learners to it, there is a high chance that learner engagement and their experience in online courses will significantly improve.


This article is summarizing data from a study regarding students receiving real-time notification and information regarding their progress in the class. The results were that the academic notifications helped students and that they favorably responded to the information they were supplied. Part of the research also concluded that the students whose grades were the highest and the lowest were the ones to most frequently check the notifications and that the middle group responded better to human interaction and assistance in making the information more easily accessible.


This study, done by an online instructor researching the importance of faculty-student communication in an online learning environment, tested the effects of frequent instructor initiated emails and whether it affected the students’ perception of the course, instructor and the overall online learning program. The results from the study were that the students’ perceptions and interactions with the course were not affected by more frequent email communication from the instructor. The emails included things such as background on course content, reminders about upcoming assignments, due dates, and encouragement. The study did show that students responded positively to the interaction, as they had predicted, but the frequency did not affect it in any way. The study also included findings from online group discussions and found that students were more affected by personal interaction from the instructors communicating with them and answering individual questions in that forum.

This article focused primarily on a test done by researchers on the effects of motivational treatments on students and their learning behaviors. The study was mainly geared towards students who were struggling in school because of low optimism or lack of motivation. The study has not been done on students of online learning, but the results found from the focus groups that were tested showed that the motivational treatments helped improve overall class test results, and the students that were part of the goal engagement treatment program outperformed their no-treatment peers by 7-8%. The treatments given were in an online format, and showed significant improvement for students with co-occurring risk factors.


The advantages and disadvantages of using Open Educational Resources in online student learning are analyzed and explained in this article. OER are defined as technology enabled open provision of educational resources for consultation, use, and adaptation by a community of users for non-commercial purposes. (IE lessons, modules, full courses/programs, guides, e-texts, articles, audio tracks, videos, multimedia, or other learning materials) Researchers performed a study at a University level to determine whether using OER as a part of Online Courses significantly helped students improve in their courses. Results showed that even with the limitations of OER, the positive impact it has on students’ learning is significant, especially as far as Interventions and Retention goes.


The purpose of this article is to analyze responses to student interventions and the efficiency levels of interventions on student learning behavioral improvements. The interventions are designed to help with the process of assessments, progress monitoring, and teaching or re-teaching material. The challenge of online programs is to meet the learning styles of students in an e-learning environment (visual, auditory, logical, social, solitary or kinesthetic). Some resources, tools or techniques could possibly include social media, video presentations, teacher-student phone conversations and emails. Part of retention is identifying students’ most preferred learning method and tailoring online learning to meet these needs.

The main purpose of this article is to demonstrate how the use of Online Collaborative Learning Programs can improve and positively develop students’ attitude towards technology. Online Collaborative Learning has five interwoven components: 1. Positive mutual dependency; 2. Personal accountability; 3. Promoting Interaction; 4. Social Skills; and 5. Group process. Collaborative learning in online courses is valuable because it counteracts the student’s loneliness, which is created in a reality where online communication is conducted via written texts, pictures, and videos, and the direct intrapersonal touch is missing. Another key point that this article makes is that students’ “attitude toward technology” has a big impact on their success in the course. The current research examined the contribution of the collaboration, satisfaction and intrinsic motivation to increase positive attitudes towards the use of technology among students from a teaching perspective. Researchers claim that the more positive the attitudes towards the behavior and the subject norms, and the higher the perceived behavioral control, the stronger behavioral intentions will be, and the stronger the intentions, the higher the chance the behavior will be performed. The theory assumes that behavior is an indirect product of information or relevant behavioral beliefs towards the behavior. In this case, the behavior is the way a student performs in an online learning course or environment.


The article analyzes the ways that Educational Interventions are being implemented, and the challenge of figuring out when and how to implement them by gathering user data as students interact with Online Programs. Data collected such as learners’ and educators’ interaction data, data mining techniques, and theories from informational sciences, psychology, cognitive science and other disciplines help researchers understand and improve “learning and the environments in which it occurs.” A study of the implementation of programs is presented, in which two components are introduced, fidelity of implementation and the process of implementation. Fidelity addresses the organizational and curricular changes that do or do not take place as intended by the new innovation, while the implementation process refers to the ways in which local agents adapt the innovation. Different studies on data analysis and learning analytics are explained and presented.


In this article, a research study was briefly outlined to do with identifying At-risk students through learning analytics and helping them improve in the course through targeted interventions. Two
classes were studied, half were randomly assigned to receive interventions of emails sent on behalf of the faculty that included online and in-person resources that could help them improve their course performance. The data collected from the students included “triggers” based on use reports that were significantly related to student final grade. Other interventions that were suggested included supplemental instruction, one-on-one tutoring sessions, or directed study resources. The interventions were shown to significantly improve student final grade.


This article analyzed the implementation and effects of Attributional Retraining Treatments to help foster engagement and motivation to improve the retention rates of struggling students. A study is presented that focuses on the hypothesis that students' performances have more to do with psychosocial variables and the nature of learning experiences than academic successes previously experienced. The AR treatments include causal attributions, shifting/changing students perceived control, and motivation treatments. The study concluded that the implementation of these treatments contributed widely to student retention and success as they continued through online courses.


This article mainly talked about tailoring the videos included in Online Learning Courses to students based on collected data taken from 6.9 million video watching sessions across four courses on the edX MOOC platform. The data collected regarding student engagement in these videos demonstrates that shorter videos are much more engaging, that informal talking head videos are more engaging, that Khan-style tablet drawings are more engaging, that even high-quality pre-recorded classroom lecture videos might not make for engaging online videos, and that students engage differently with lecture and tutorial videos. For each of these findings, there are suggestions given as far as different ways to improve production and style of the video presentation in order to appeal to and support student learning more, all while analyzing student behavior in the different settings.

In this article, a study is described in which data from an online sociology course was shown in regards to the effects of time spent online on the final grades in the class. The object of the study was to estimate the relative importance of time spent online, prior grades, and demographic characteristics of students in terms of their academic performance in online sociology courses. Using a multinomial logistic model, the current study examined the odds of attaining one grade versus another depending on the amount of effort and controlling for gender, major, and year in school. The study found that there is a positive relationship between the time spent in the course with the grade and performance in the course. Quantifying the influence of time spent online on grades is important from the perspective of the university administrator, who is in charge of teaching policies; from the perspective of the instructor, who is responsible for student learning outcomes; and from the perspective of the student, who seeks to balance time and effort.


This article focuses on aiding students in online courses by describing methods of collaboration, conversations and interactions between the student, teacher and online support personal. There are five basic approaches to supporting students: one-on-one consultation (clinical model) through an “open-door” policy; separate accredited subjects within existing courses; parallel classes; generic support and teaching and learning partnerships that embed the student learning support into mainstream teaching programs.


This article was mainly describing a system of ‘blended learning’, in which a law school wanted to overcome challenges in student learning by first, providing the information and necessary materials in an engaging and appropriate manner and second, to free up the class time to allow greater emphasis on application and interactive worked activities, rather than traditional lecture modes. The videos that were created and presented to the students proved to be a helpful tool in providing the information and materials, allowing for more engaging activities to happen in the classroom. The reports from the students were that they found videos to be helpful and were able to understand the material overall in a better way.

Identifying At-Risk Students, Retention and Interventions

Research and data collected at Valencia College regarding student retention and intervention in Online Classes is favorable towards making an extra effort to track and follow students’ progress and supply needed aid when a student falls behind. Data on student participation online in assignments and discussion boards, how often a student logs in to the school’s learning platform, and data on the student’s academic background give a holistic view of the student and help teachers more quickly flag a student who is struggling and better pinpoint what types of interventions might be needed. Personalized emails, one-on-one or group tutoring, peer-to-peer mentoring, meetings with an advisor along with other methods are all part of intervention techniques administrators might use to help students better succeed.


This article focuses on the review of the Learning Analytics Intervention, its purpose and effects/examples. The research included ideas for identifying at-risk students, including the number of log-ins to the LMS by students, the frequency with which students engage with learning and teaching materials, and the results of assignments effectively predicted students’ course performances. The Learning Analytics Intervention program compiles and reviews the data taken from students’ performance in the online learning course in order to help target instructional, curricular and support resources to empower student success. Some of the specific strategies used in the targeted intervention include posting the signal (how the student is doing), emailing, texting, arranging a meeting, telephone, using teaching materials, instructional materials, tutoring, and providing guidelines and advice. Using teaching materials for the intervention is most frequently used, followed by emailing and providing guidelines. The interventions are specifically tailored to the students’ individual challenges, found by using the initial review and methodology.


This article focuses on the idea that internal motivation is the best and most essential characteristic for succeeding in self-regulation, which is a big part of online learning. The statistical survey that the Pamoja Education Course gave to its students (to collect data regarding their background information) was seemingly insignificant and unhelpful as an early warning system to determine at-risk students, which led the support staff to develop to ‘locus of control’
approach/intervention. An online quiz was developed (extensively outlined as part of the article) to assess students and whether their mentality was such to support self-regulation in online learning. The quiz not only gave instructors a clear view of where the student was at, but it allowed the student to self-reflect as well. The study compared gender to Locus quiz scores and then compared them to the final grades of the students in the class, and the results were that they were all correlated and helpful for gaining information and data, and could be beneficial for identifying at-risk students and motivating them throughout the course to increase in their retention.


This paper focuses primarily on reasons why a student might be more at-risk of withdrawal and different ways that retention and interventions could be improved. A chart included in the paper outlined some of the factors influencing persistence decision and attrition rates. Prior to admission, student characteristics (age, ethnicity and gender, intellectual development, academic performance and academic preparation) combined with student skills (computer literacy, information literacy, time management, reading and writing and computer based interaction), and external factors (finances, hours of employment, family responsibilities, outside encouragement, opportunity to transfer and life crises) have an effect on the factors after admission. After admission, internal factors (academic integration, social integration, goal commitment, institutional commitment, learning community, study habits, advising, absenteeism, course availability, program fit, current GPA, utility, stress, satisfaction and commitment) combined with student needs (clarity of programs, self-esteem, identification with school, interpersonal relationships and accessibility to services) and pedagogy (learning styles and teaching styles) have an effect on the persistence decision. In a study of factors that influences students to withdraw, the most common were personal reasons (life and work commitments) and programme reasons (learning style or fit with career). Some programs that were implemented to lessen the amount of at-risk students included strategies related to course design (matching learning style to course design), ensuring social interaction, course delivery (mentoring, mid-term progress reports, regular student contact), strategies related to programme organization (mandatory orientation, academic advising, success strategies course, careful admission screening, and a focus on student-university relationship attitudes), and strategies to ease re-integration (formalized re-entry plans). Some statistics and data were also presented supporting the theories and analysis of the ways to improve student retention and better implement interventions.

This article articulated specific and direct ways that at-risk students were being identified and ways to target interventions toward their specific needs based on various research conducted. Researchers were identified as using a range of computational techniques to predict learning progression (ie Bayesian modeling, cluster analysis, natural language processing, machine learning, predictive modeling and social media analysis). The article stated that while many researchers and institutions are experimenting with small-scale targeted interventions, there is no comprehensive conceptual model, with a strong evidence base that describe how teachers and administrators can use learning analytics to make successful interventions in their own practice. Different techniques such as monitoring VLE data (number of clicks, number of messages posted in a discussion forum, number of computer formative assessments attempted) supplemented by individual learner characteristics (prior educational attainment, socio-economic data, or motivation) were shown not to be as effective for identifying at-risk students as other, more in depth analytics, such as researching learners’ activities during continuous assessments over time. The Open University Analytics study used predictive models constructed by machine learning methods from legacy data recorded in the previous presentation of the same module and performance of learners predicted weekly from the predictive models and the learner data of the current presentation to make their predictions. The article went over different methods and protocol to helping students who are at risk as well. Before the start of the course, a learner will be assessed on their strengths and weaknesses in 4 categories, cognitive, social, teaching, and emotional, and specific guidelines are given to support the student throughout the course relevant to the category he or she struggled the most in.


The purpose of this article was to analyze an experiment in which learning outcomes as a function of student age (Traditional vs nontraditional) in relation to mode of instruction (online vs face-to-face) were studied among students enrolled in an undergraduate business program. The results of the study suggest that traditional-age students, regardless of whether they take courses online or on campus perform similarly on an outbound peregrine assessment. In contrast, there was a marked difference in the performance of nontraditional-age students as those learning online scored significantly higher than those taking classes on campus. A point made in the article stated that student age serves as a function for student motivation, such as a traditional student wanting to earn a high grade versus a nontraditional student wanting the practical application elements of education. Older students enroll in higher education because of intrinsic motivation (e.g. self esteem, cognitive interest), whereas younger students note external motivations, such as social relationships or parental expectations. For both types of students, factors such as academic efficacy, self-regulation, and social support serve as predictors of academic performance. The expectation is that older students adopt learning strategies geared
toward comprehension of course material while younger students use learning strategies aimed at rote recall. One suggestion that is made applies to higher education, specifically for students in their thirties, forties and fifties: Given their greater amount of work/life experience (in the case of this study, business experience), universities may consider developing competency-based programs that account for their experience.


The purpose of this article was to explain the methods used by Purdue University to aid in Student retention and Intervention programs with Online Learning. The learning outcomes are delivered to students through a personalized email using “traffic signal” light colors to indicate how each student is doing. There are predictive models (algorithms) used by administrators that predicts students risk status, which has four components: performance (measured by percentage of points earned in course to date) effort (interaction with Blackboard Vista compared to peers), prior academic history (academic preparation, high school GPA, standardized test scores) and student characteristics (residency, age, credits attempted). The school has an ‘intervention schedule’ implemented that includes the traffic signal indicator, email messages or reminders, text messages, referral to academic advisor/resource center, and face to face meetings with instructors.

Note from Kirk: The creators of Course Signals were later found to have exaggerated the benefits of their system, so this study is perhaps irrelevant but in case there are concepts that are helpful I’ve left it in.


This article primarily focused on whether students on online learning are getting the support that they need to be successful. The article explains that research and data shown on online learning points to significant struggles with anxiety, isolation, risk of attrition, and other stressors present on the degree path. The article goes into detail about the reasons behind these issues and then presents a couple of ideas for improving retention in these cases. Online Collaboration Learning is explained, as well as the brief mention of technologies and learning strategies that makes sure online learners receive targeted support from well trained staff in order to help support the students who are struggling.
Raley, M. (2016). Mental Health in the Online Classroom: Are Distance Learners Getting the Support they need for the challenges they face? Distance Learning, 13(2), 51-56.

This article analyzes the pilot residential learning community project at Indiana University Southeast, which targets first-generation students who are academically at-risk. The study tracks the students’ progress and performance to see if they improve in a number of aspects such as student engagement, academic performance, and second-year retention/credit-hour completion. According to the study, research shows that one of the main reasons students are at-risk of dropping out is because they feel like they don’t belong. The RLC works to connect students with each other so that they have a stronger support system that can help in both retention and interventions. To measure the effectiveness of the RLC, surveys were created and given to the students to measure student engagement, data was gathered on retention and credit hour completion, and assessment tools were created to measure student learning.


This article mainly focused on the ‘redesign’ of the traditional lecture method in college learning, with an emphasis on targeting those students that are at-risk and making sure they have the necessary tools to succeed. The article used data collected from different schools/projects using this redesign method and explained six characteristics that make them unique. These include: Whole Course Redesign, Active Learning, Computer-based learning resources, mastery learning, on-demand help, and alternative staffing. The Program in course redesign demonstrates how information technology and asynchronous learning strategies can be used to address challenges with both students and educational costs.


This article summarized the findings of multiple research studies that collects and organizes data collected in a few different ways from Student Learning in order to identify students that may be at-risk and administer interventions in the right way and at the right time. The paper specifically describes the work of the Open Academic Analytics Initiative that specifically focuses on
researching issues related to the scaling up of learning analytics technologies and solutions across all of higher education. Different data collections and sets are included to explain and support the ways that the open source analytic initiative is beneficial to learning more about the learning behaviors and issues pertaining to student online learning. The results from the research are positive and demonstrate the ways that learning analytics can help identify at-risk students more quickly. Based on the research collected by the initiative, students tend to fall into one of two broad categories: those who improve after receiving just one intervention, and those who do not improve regardless of the number of interventions received.


This article described and explained a study done by researchers at the University of Michigan where a summer bridge program (done by high school students the summer before their first semester of college) were used to model a school semester in order to study student behaviors and project qualities of an at-risk student. Research focused on students’ incoming demographics and prior academic performance to predict academic performance at the university level. The study investigated students motivation orientations over the course of one bridge program and how a learning analytics based intervention was employed by academic advisors to inform the students in face-to-face meetings. The results of the study actually showed that the students’ mastery orientation decreased over the course of the bridge program, and indicate that students exposure to displays of their academic performance negatively predicts this change. A complex algorithm was used to predict student success and mastery of a course based on previous achievements and defining characteristics, and how they performed in the bridge program.


This article mostly focused on research done at Rio Salado College, where a study based on a group of students from an online accounting course at the freshman level was taken to analyze the process of big data collection in order to identify at-risk students and assist them as soon as possible to help them improve and succeed in the course. The system titled RioPACE running within the RioLearn LMS tracked students progress and recorded data such as log-in activity, site engagement and pace. This information was available to the instructors and categorized into warning levels (low, moderate and high). The instructors then had the ability to administer interventions (generally focused towards the middle category who could improve enough to change the statistics by receiving some form of intervention), mainly described as two pilot
programs, the “eighth day interventions” and “automated course welcome emails”. The eighth day interventions took place on the eighth day of the course, involved students at the moderate level and usually was a unique intervention strategy (most often phone calls) that was shown to statistically improve students success rates. The automated course welcome emails were sent out the night before the course start date with a reminder to log in, contact their instructor and begin participating in the course. The results of this intervention were significant and generally positive.


In this article, the main purposes were to analyze and describe the challenges with online learning and ways to overcome them. According to the analysis presented by the article, factors contributing to a student being successfully self-directed include females, caucasian students and individuals with higher prior educational attainment. A suggested system of early warnings to identify and intervene for students who are struggling is described, with example indicators including a student failing to sign into an online system, or a student failing to turn in an early ungraded assignment. The article also suggests colleges facilitate online learning by incorporating the teaching of self-directed learning skills into courses through teacher support including developing materials, assignments and other pedagogical processes that cultivate these skills.


The main purpose of this article was to analyze different risk factors students face that lead to attrition and different methods and techniques institutions and educators can use to overcome them. Factors believed to lead to possible attrition included in the article are personal reasons (family problems, finances, child care, distractions, and job needs/demands), reported confusion, anxiety, and frustration because of lack of prompt or clear feedback from the instructor, and from ambiguous instructions on the course website and in email instructions from the instructor. Students also frequently reported isolation when it came to online learning courses. The study presents four major strategies that may be used to decrease attrition rates in distance education courses, including student integration and engagement, learners centered approaches, learning communities, and accessibility to online student services. Student Integration and Engagement methods described included faculty initiated contact via phone calls, course orientation, informal online chats, and online student services. Learner Centered Approaches include beginning the
course with “virtual icebreakers” to stimulate communication as well as posts made by instructors and encouragement for students to post as well. Learning Communities include the development of group projects and assignments that encourage students to develop relationships with other members of the learning community. Finally, the Online Student Services offered should include assessments, educational counseling, registration, technical support, study skills assistance, career counseling, library services, students’ rights and responsibilities, and governance. The main point that the article made was that engaging students as early as possible and keeping them engaged is the key to helping them succeed.


This article mainly analysed different ways that student retention can be implemented using learning analytics and mapping institutional progress. The framework for implementation of student retention strategies included six domains which helps learning analytics be more widely understood and used. The six domains include transitional institutional elements (culture, positioning of LA within the institution, level of sponsorship, governance arrangements, alignment with institutional strategy, and sustainability), learning analytics infrastructure (system reliability, system sophistication, and relevant expertise), transitional retention elements (retention planning, retention strategy and implementation, governance arrangements related to student retention), learning analytics for retention (educational and business questions asked from stakeholders, ability of the system to address the questions, accessibility and ease of use of the system, tools and reports, consideration and resolution of the ethical issues which may arise from the implementation and use of learning analytics) and intervention and reflection (training, support and time for staff and students to use systems, interpret data and reports and act on them, endorsed processes around actions or interventions arising from data, and modification of relevant elements, systems, factors and interventions).


The main purpose of this article was to summarize individual articles pertaining to student online learning. Some factors of online learning analyzed in the article summaries included pre-determination of learner characteristics such as first-term GPA, gender, age, and statistics of student involvement in the online courses such as the frequency of times students participated in instructor-facilitated online courses where they wrote, edited, and reread posts more, made connections to others’ writing and had a stronger sense of community than an online course facilitated by peers. There was also information in one of the articles pertaining to an algorithm used by one online course where student feedback aided in the improvement in learning outcomes.
The main purpose of this article was to explain some of the challenges of education and how increased student engagement and the incorporation of blended learning helps alleviate some of these challenges. Something worth noting is that from the research gathered and data collected from interviews with students, it seems as though students very seldom negotiate with the staff to find suitable learning spaces within the blended environment (at the point the article was written). The negotiation seemed to be subtler and involve the student expectation of their ability to control technology, their forthcoming educational experience, and expectations of managing their 'learning space' (typically at home).


Identifying At-Risk Students

The research done as part of the Soomo Learning Environment Program demonstrated that students who access the information early, continue accessing the resources throughout the early weeks of the course, and perform well on formative activities are more likely to succeed. Models or algorithms collecting data about these things allow predictions to be made and necessary interventions to be given in time for improvements to be made. The combination of individual-feature models and a comprehensive model enables online support personal to identify which students are at risk and provide instructors with information about which students are at risk and why.


This study uses tables analyzing factors that pertain to at-risk students and the data from study done by the Marist College Open Academic Analytics Initiative (OAAI) to demonstrate that certain methods and measures used are helpful to the retention and intervention of online students. The methods used (announcements, messages, calendars, forums, chat rooms, videoconferencing, syllabus, assignments, lessons and resources) allow data to be collected regarding student participation, such as course content read, number of contributions made, forum discussion threads read, number of exams and assignments submitted and grades given. From the
information and data collected, the program concluded that the characteristics of the students (age, gender, full/part time status, or academic probation) are not strong indicators of at risk students. They did find, however, that characteristics such as race, family income level and distance from home to be important in this determination.


This article focuses on identifying students who may be at risk earlier and with more accuracy by using the time-clustering method. Effective warning systems used could provide formative grade feedback and helps online systems take proactive steps to intervene before a student drops out or falls behind. The article reviews the aggregation approach of predicting behavior in students such as frequency of login, frequency of content access and time spent in the course, and expounds upon the failures and flaws of this method (ie fails to consider variances in learning patterns, student learning preferences, course activity requirements, contextual variances across the semester and full potential of data). The Time-Series approach is introduced and explained as a combination of prediction/forecasting, classification, and segmentation, using demographics and prior academic records as static data. The benefits of this are that it captures variances of individual students on learning on a daily basis, allowing for more accurate predictions and at a higher frequency.


This article analyzed different ways at-risk students’ response to online course and how to predict their behavior in order to increase retention and incorporate interventions. The study focused on four prototypical trajectories of engagement in student online learning. The algorithm uses course demographics initially to gain an understanding of students, and then it uses clustering to identify how the students move through the course in order to be able to help at-risk students at the earliest point possible. During the course, there are ‘assessment periods’ in which students are labeled either “on track” (did assessment on time), “behind” (turned in the assignment late), “auditing” (didn’t do the assessment but engaged by watching a video or doing a quiz), or “out” (didn’t participate in the course at all). The demographics of students participating in the course was used along with the data found through clustering analysis to identify students at risk both before the course begins and throughout the course.

The purpose of this article was to present and analyze different factors and indicators used to predict how students will perform in a blended learning course. According to the article, there are seven variables to consider when predicting: gender, degree sought, students' academic level, attendance for the first 4 weeks of face-to-face classes, scored on orientation extra credit assignments, grades on the first quiz, and grades on an early semester reflective essay. The results and data also show that students' self-regulation skill or learning presence in the community of inquiry model is a strong predictor of student success.


This article mostly outlined what the purpose of collecting data about the behaviors of students is (to understand better the factors that influence the learning process and the outcomes of individual learners) as well as the different ways of collecting and measuring the data and the ways in which it can be used to benefit both instructors and students. In the article, a study and groups of data are presented outlining statistics taken from students online learning logs and classes that show aspects of their login behavior, resource utilization, quizzes, interactive behaviors, and academic achievement. To address issues, statistical analysis, visualization social analysis and correctional analysis were used to analyzed the process of online behavior. Both the students and instructors were analyzed and reports provided helped improvements become recognized and instituted. Results from the study indicated that students’ resource access, quiz attempts, and forum browsing showed positive correlations with their overall scores. Teacher interaction is strongly encouraged, and data from studies to do with student-teacher interactions and the specific benefits to learning are presented.


This study focuses primarily on how typical ‘retention strategies;’ are not as effective as other ways of student retention, such as strategies introduced in the article surrounding individual characteristics of students. A study was performed in which students from a large state university were analyzed and the results showed that prior performance in college (cumulative GPA), and class-standing (senior vs non- senior) were significant characteristics related to student retention in online classes. Other factors significantly related include previous withdrawal from online courses, gender, and recipient of academic loans. Demographic variables such as gender, age, and race are potential explanatory variables to the variance in student retention in institutions of
higher education. The article explains and analyzes these factors in relation to the retention of students in online learning courses.


This article clearly articulated the uses and structure of different data collection/learning analytics that have been and are being used to help identify at-risk students. According to the article, big data (datasets whose size is beyond the ability of a typical database software tools to capture, store, manage, and analyze) is a lot more productive in the context of helping improve student learning and retentions than other ways of collecting data. Analytics in learning should be cycled through these 5 steps, as proposed by the researchers writing this article: Course level (Learning trails, social network analysis, discourse analysis), Educational data-mining (predictive modeling, clustering, pattern mining) Intelligent curriculum (the development of semantically defined curricular resources), Adaptive content (adaptive sequence of content based on learner behavior, recommender systems) and Adaptive Learning (the adaptive learning process-social interactions, learning activity, learner support, not only content). The article then goes on to describe LMSs and VLEs and their functions and flaws. The article suggests that new ways of using technology should be looked at and used (ie mobile devices/smartphones and tablets/ipads) to bridge the gap between the physical and digital worlds by capturing location and activity. The article states, “analytics in education must be transformative, altering existing teaching, learning, and assessment processes, academic work, and administration.


This article explained the use and benefits of Learning Analytics from the perspective of faculty members using the data and technology to help their students have success and improve in their online course learning. The article talks about making sure through data collection and analysis that students are having a ‘personalized learning experience’ instead of assuming that students will all start the course and proceed through it at the same pace. The article goes through all of the institutions that have had success using Learning Analytics to improve student success and retention and states that the institutions that have had the most success are the ones that have made use of ‘dashboard’ indicators for both students and faculty to be able to track student progress. The Universities and Institutions mentioned include The University of Central Florida (EIS- Data Management), Rio Salado Community College (PACE- Track student progress in course, intervention), Northern Arizona University (GPS- Student Alerts for academic issues and successes), Purdue University (Course Signals System-Student alerts for academics issues, interventions), Ball State University (Visualizing Collaborative Knowledge Work- Enhance knowledge-building work), University of Michigan (E^2 Coach-student support and intervention),
University of Maryland Baltimore County (Blackboard LCMS-track performance and predict student success), Graduate School of Medicine, University of Wollongong (BIRT- Reveal continuity of care issues). Other institutions have made use of learning analytics as well and have seen much success as far as student retention and success. Data generated by LMS includes:

Number of times resource accessed, date and time of access, number of discussion posts generated, number of discussion posts read, and types of resource accessed. Data generated by instructor included: grades on discussion forum, grades on assignment, grades on tests, final grades, number and types of questions asked in a discussion forum, and number of emails sent to instructors. Some ways that the article stated student achievement can be improved includes monitoring individual student performance, disaggregating student performance by selected characteristics such as major, year of study, ethnicity, etc., identifying outliers for early intervention, predicting potential so that all students achieve optimally, preventing attrition from a course or program, identifying and developing effective instructional techniques, analyzing standard assessment techniques and instruments, and testing and evaluation of curricula.


This article summarized different data mining methods that have been used to study the impact of virtual classrooms in e-learning. The issues that are presented as far as student learning goes include the lack of collaboration and communication facilities which lead to students feeling lonely and unsupported. The results of the research shows that student participation in virtual classroom sessions have the most substantial impact on the students’ final grades. Different ways of collecting student information include viewing courseware, uploading assignments, posting messages in forums, writing messages to teachers and other students, etc. During online sessions, different mediums are used to support interaction and learning, including video, audio, document sharing, whiteboard, and text chat. Students’ activities are collected and classified into nine categories: resource view, virtual classroom participation, archive view, assignment view, assignment upload, forum read, forum post, discussion read, and discussion post.


This article analyzes the ways that data mining helps to predict the relationships between themes that students demonstrate and how they predict final grades. Educational Data Mining and Regression analysis to analyse live video streaming which has shown that students’ participation
and login frequency, as well as the number of chat messages and questions they submit to their instructors. The video streaming course is presented to students and students are able to hear from their instructors and ask questions and then based on the questions asked, predictions can be made projecting the outcomes for them in the course. At-risk students can then be identified and interventions can take place in order to help them with the issues they are struggling with. Student’s final grades are predicted by student motivation, learning style and previous background, the instructors teaching and grading scales, the exams and assignment difficulty levels, as well as the questions they ask in the course.


This study presented demonstrated a combined approach to predicting student performance that included learning analytics, educational data mining and theory. The article analyses different methods and means by which a student performance might be predicted and different real life examples are given as well. The student performance prediction model presented in the article begins with the theory, which is divided between contextualization and computation. Contextualization leads to the learning analytics and the computation leads to the educational data mining section. From there, Learning Analytics is connected to the application segment by interpretation, and EDM is connected to application by optimization. The Learning Analytics and EDM are also connected, making a theoretical framework for the student performance prediction model. The model is supposed to provide a holistic approach to interpreting and implementing the data collected based on each individual student and their own data.


Research presented in this article demonstrated main reasons students might decide to drop out of an online course. Issues of isolation, disconnectedness, and technological problems may be influences, but the results from this study show that the demographic variables for dropping out of an online course are varied and unique to each individual. A large study included in the article and undertaken in the UK confirms that students are more likely to dropout if they don’t feel that they’ve been placed in the appropriate course, applied to college late, find it difficult to make friends, find it difficult to settle in at the beginning of the course, are less satisfied than current students with the quality of teaching, are less satisfied than current students with their course timetable, are less satisfied than current students with help either to get a job or to go to university, are male, have difficult financial circumstances or family circumstances, and have their fee waived or reduced. Another study done at Edith Cowan University found that students
reported that work, family, study commitments, insufficient time, ill health, and study load were the reasons they withdrew. The relationship between the student and the teacher (students’ satisfaction with their communication with the teacher) is a factor that distinguishes students who choose to continue or dropout.


This article describes how algorithms are used to identify at-risk students or student’s failure to complete their work. There are predictions models that help determine the factors of at-risk students as well as the algorithms that can be presented to students as part of an intervention in order for them to realize and understand their progress. The algorithms and prediction models focus on students near the pass/fail border, in other words, those who could most personally benefit and increase the overall course pass rate by an incremental investment.


This article focuses on specific methods for looking at the data recorded as part of research of online student learning. It specifically demonstrates two types of methods that allow instructors to view students’ progress and predict whether or not they are ‘at-risk’. The first method, known as the recurrent neural network architecture, takes an algorithm programmed with data collected from students and produces an output of the student’s next action, based on their previous actions. The other model is called the n-gram technique and does a similar technique with input and outputs of data. There wasn’t specific information about student data collected other than the ways that the formulas worked.


This article primarily analyzed a technique in which data from student performance is taken and organized into clusters, describing different factors in which they are similar. The four primary categories of students based on their activity of attending quizzes, watching videos and engagement in discussion forums were: (1) Registrants: Students who just enroll in a course and never show up. (2): Active Learners: students who do some type of activity like watching a single video or attending one quiz. (3) Completers: Students who successfully finish all quizzes but do not ask for certificates. (4) Certified Students: concerns the completers who ask for certificates later. The five clusters that students were placed in are as follows. (1) Enrollees: students who are
not active. (2) Low Engagement: Students with very low activity. (3) Videos: Students who primarily watch videos. (4) Videos and Quizzes: Students engaged in videos and do quizzes. (5) Social: Students who participate actively in discussion forums. An interesting dataset analysis revealed that Extrinsic factors (Examination, preparations, certificates, badges) and Intrinsic factors (subject, didactic approach, instructional design) have relation to learner commitment in the classroom. As Extrinsic factors stay the same, ‘withdrawals and drop-outs’ tend to occur. When extrinsic factors increase, a rise in ‘playing the system/low commitment’ occurs. When Intrinsic values stay the same, ‘withdrawals and dropouts’ occur, and when Intrinsic factors increase, social motivation/rebellion occur more frequently. However, when both Extrinsic and Intrinsic factors increase, a result of ‘High Commitment’ emerges, which is the optimal position for student online learning success.


In this article, Elias presents research focusing on the reasoning and methods of improving learning for nontraditional learning processes, specifically as it pertains to collecting learner data through Learning Analytics. Learning Analytics seek to capitalize on the modelling capacity of analytics: to predict behaviour, act on predictions, and then feed those results back into the process in order to improve predictions over time as it relates to teaching and learning practices. The article also analyzes a few different studied that have been done surrounding learning analytics, such as using a system of visualization and graphical representation of web log data generated by the WebCT CMS as well as the main idea/information behind Purdue University’s Signals. The five steps of analytics are described as: capture, report, predict, act and refine. Different tools used to measure and present data collected from the ‘student life cycle’ (initial admission, through course progression and finally graduation and employment transitions) include: data visualization, decision trees, neural networks, regression analysis, machine learning, and artificial intelligence. According to the article, student activity reports given to teachers monitoring data such as total views, sessions, online time, and viewed resources could be helpful in identifying at-risk students. Social network analysis including data from chat logs, discussion forum postings, blog posts and comments.


The article mostly focused on different data analysis’ to do with student learning. Different datasets are used to create algorithms to better assess the development and improvement of students as they go through the online course. Frameworks for collecting data typically are broken up into three parts, dataset properties (describe the overall dataset, such as the
application and educational setting from which the data was taken), data properties (define at a finer grained level where data elements are available, including action types such as downloads or selects and information about the learner and other entities involved), and objectives that describe the potential usefulness of a dataset for LAK research purposes.


This article mainly described the changes that the internet and the shift from the ‘search’ learning tool to live information delivered directly to the consumer through what is called ‘push learning”. The new direction that institutions and universities are taking is to utilize this tool of push learning, previously used by advertising companies and businesses, to ‘nudge’ students to engage, study and participate more in learning. The article describes this change as happening mostly over the next few years, but emphasizes that even with big data collection and push learning to help remind students to engage, the most important thing to remember is that learning is rational and motivated and supported by relationships and human connection.


The purpose of this article was to present significant behavioral indicators of learning using learning management system data regarding course achievement. The results from the study indicated that students’ regular study, late submissions of assignments, number of sessions (frequency of course logins), and proof of reading the course information packets significantly predicted their course achievement. The research also includes different learning strategies, including self-directed learning, clear and active communication, the management of concurrent discussions, sociality in online learning, the management of information overload, information processing strategies, time management, information interpretation skills, the management of asynchronous tasks, self-efficacy in completing online course, and a positive attitude toward online courses. Time management skills, followed by self-efficacy in completing the course and a positive attitude were the most dominant predictors of achievement.

The main purpose of this article was to describe a program implemented by the University of Michigan during their Summer Bridge Program in which a learning analytics powered ‘Early Warning System’ was used by academic advisors to support the students’ learning activities. Data was taken from academic advisors’ use of the system as well as students’ activities and specific log data to aid in learning more about the ways that the academic advisors and students are informed about student progress as the course develops over the summer. The advisors had access to a program called Student Explore that tracked data to do with student progress based on grades, course assignments and their performance relation to other students. The students and academic advisors had meetings to review progress throughout the course and the results of the study showed that the frequency of time advisors spent on the student explorer site was highest when the meetings were taken place, as opposed to before/after meetings.


The main purpose of this article was to explain and analyze different institutions that have implemented data collection and learning analytics and the ways they can be used to help in retention and interventions with students that are at-risk. Five steps of analysis are identified, including Capture, Report, Predict, Act and Refine. The article shared information about solutions that four institutions have taken to understand the data collected and how they can use the data to make better decisions about program content and course delivery. The main programs implemented at these institutions includes the LCMS, Equella, to collect and store data and resources, the E^2 coach, a student support and intervention program, Early Warning Systems (data from an SIS, a CMS and the grade book and is based on a student success algorithm. The article also includes some suggestions and things to take into consideration while organizing and responding to the data. The suggestions include strategic planning, being conscious of the ‘big brother’ viewpoint, expertise, presentation, standards, investigation, identification, and training and development.

Appendix E: Formative Evaluation - Notifications Report

Low Grade Notification

Instructions: Imagine you’re in an online course and after about six weeks your grade has dropped. If you had signed up to receive notifications from BYU Online, which ones would you prefer? Circle any options you like, cross out any you don’t like, and leave them blank if you’re indifferent.

Option 1

We wanted to reach out to let you know your grade in <class name> has fallen 10% below the class average. Setbacks are normal and should be viewed as an opportunity to learn and grow. Our TAs are prepared to help in any way that you might need. Continue working hard and adapting your approach or strategy and you can improve and be successful! (smiley face emoji)

Option 2

It can be tough to keep up with assignments and coursework! (stressed face emoji) Our records indicate that your current grade in <course name> is at least 10% below the class average. Fortunately, your TA(s) <TA first name(s)> is/are available to help you be successful! (thumbs up emoji)

Option 3

According to our records, your current grade in <class name> is at least 10% below the class average. Everyone experiences setbacks. Through hard work, asking for help, and adapting your strategy you can be successful. We recommend reaching out to your TA for support.
Login Reminder Notification

Instructions: Imagine you’re in an online course and you’re so busy with your face-to-face courses you have forgotten to log into your online course for a week. If you had signed up to receive notifications from BYU Online, which ones would you prefer? Circle any options you like, cross out any you don’t like, and leave them blank if you’re indifferent

Option 1

Why did the man become an archaeologist? Because his life was in ruins! Although we are sure your life isn’t in ruins, our records indicate that you haven’t logged into Canvas (byu.instructure.com) in a few days and wanted to remind you that it is important to log into your
course regularly in order to be successful. Feel free to reach out to your TA <TA name> for any support you might need! (okay hand emoji)

Option 2

Hello, <name>!

I miss seeing you! –Canvas

Don’t let your course get too lonely! Our records indicate that you haven’t logged into Canvas in a few days. We know long-distance relationships can be tough, but by diligently checking in, you can be successful. Let us know if we can help in any way!

Option 3

At BYU Online, we realize time flies! (hourglass emoji) Just don’t let too much time pass without logging into your online course <course name>! Checking your online course regularly is a key to success!

Option 4

According to our records, you haven’t logged into Canvas (byu.instructure.com) in a few days. We get it. Life’s busy. Here’s something to remember: successful online learners tend to log into their course regularly. We’re here to help.
Low Page Views Notification

**Instructions:** Imagine you’re in an online course and you’re so busy with your face-to-face courses you have neglected your online course and your course activity is much lower than that of your peers. If you had signed up to receive notifications from BYU Online, which ones would you like to receive? Circle any options you like, cross out any you don’t like, and leave them blank if you’re indifferent.

**Option 1**

Why didn’t the skeleton go to the party? Because he had no-body to go with him! Even though it might get lonely at times, we recommend checking into your course frequently in order to stay up
to date on assignments and coursework. Our records indicate that your activity in <class name> is a bit lower than that of your classmates. Make sure you are up to date on everything and let your TA <TA name> know if you need any support!

Option 2

Hey there, <name>!

We’ve noticed that your activity in <course name> has been a little lower than your classmates’. Although this could be due to a variety of situations, checking in more frequently could be beneficial to you and help you be successful. We recommend checking your course progress and making sure you are up to date on everything! Don’t leave your course hanging! (hang loose hand emoji)

Option 3

We’ve noticed that your activity in <course name> has been a little less than that of your classmates. Spending quality time with your course can help you be successful. We recommend checking your course progress and making sure you are up to date on everything! You got this! (flexing arm emoji)

Option 4

According to our records, your activity in <course name> is a bit lower than that of your classmates. We recommend checking your course progress and catching up, if needed.
Additional Survey Questions

A few other questions were asked on the surveys. Below are the results.
Name Preference (n=96)
If you were receiving a notification from BYU Online, would you want the message to:

- Address you by name (I like when there’s a personal touch) 51%
- You don’t care either way 40%
- Not address you by name (You don’t know me!) 9%
If you were in an online course, would you sign up for notifications like this? (n=36)

- Yes, 64%
- Maybe, 28%
- No, 8%
If not, why? (Circle all that apply)

- I don't like receiving emails or text messages: 6
- Messages like this would just discourage me: 3
- I'm confident in my online learning abilities: 3
- Other (please explain on the back of the sheet): 0
Which types of notifications would you want to receive in an online class?
(Select all that apply)

- A heads up that your grade is 10% or lower than the class average 63
- Notification that your course activity is significantly lower than that of your peers 57
- A reminder to log in (if you haven’t signed into your class for 7 days or more) 55
- None of the above 3
Appendix F: Invitation Survey

Receive notifications and tips to help you stay on top of your online course! This involves reminders to check the class if you haven't logged in for a week or if your course activity is low, a prompt to reach out to your TA if you fall behind, and relevant online learning tips to help you be successful.

Sign up to receive these helpful notifications below. Please note, you can opt out anytime by responding to any message, “Opt out.”

- Sign up
- No thanks

Display The Following Questions
  If No thanks Is Selected

Thank you for your time.

Display The Following Questions
  If Sign up Is Selected

What is your preferred first name?

How would you like us to communicate with you?
- Email
- Text message

Display This Question:
  If How would you like us to communicate with you? Email Is Selected

What is your email address?
Display This Question:
If How would you like us to communicate with you? Text message Is Selected

What is your phone number?

______________________________

Those who sign up for the notifications will then select their preferred method of communication, text or email, as well as enter their phone number or email address.
Appendix G: Summative Evaluation - Instrument

The notifications I received helped me:

- Remember to regularly log into my online course:
  - Strongly agree: 25%
  - Somewhat agree: 25%
  - Neither agree nor disagree: 20%
  - Somewhat disagree: 13%
  - Strongly disagree: 12%

- Remember to work on my online course:
  - Strongly agree: 29%
  - Somewhat agree: 20%
  - Neither agree nor disagree: 16%
  - Somewhat disagree: 13%
  - Strongly disagree: 12%

- Be motivated to stay on top of my online class:
  - Strongly agree: 21%
  - Somewhat agree: 21%
  - Neither agree nor disagree: 33%
  - Somewhat disagree: 17%
  - Strongly disagree: 8%
Please indicate the extent to which you agree with the following statements:

- If I were to sign up for another online class, I would sign up for notifications again.
  - Strongly agree: 29%
  - Somewhat agree: 38%
  - Neither agree nor disagree: 17%
  - Somewhat disagree: 8%
  - Strongly disagree: 6%

- I like to know where I stand relative to my classmates.
  - Strongly agree: 30%
  - Somewhat agree: 21%
  - Neither agree nor disagree: 17%
  - Somewhat disagree: 4%
  - Strongly disagree: 4%

- I like to know if I'm falling behind in a class.
  - Strongly agree: 63%
  - Somewhat agree: 38%
  - Neither agree nor disagree: 6%
  - Somewhat disagree: 2%
  - Strongly disagree: 1%

- I like reminders to check into online courses.
  - Strongly agree: 33%
  - Somewhat agree: 33%
  - Neither agree nor disagree: 6%
  - Somewhat disagree: 8%
  - Strongly disagree: 25%
Please select all that apply:

![Bar chart showing percentage of responses]

The notifications were helpful  The online learning tips were helpful

The frequency of notifications was:

- **39%** Just right (9)
- **52%** Too often (12)

[Legend: Green = Just right, Orange = Not often enough, Red = Too often]
I would have liked: (Select all that apply)

- More tips: 48%
- Less notifications: 39%
- The number of tips and notifications was just right: 28%
- More notifications: 9%
- Less tips: 4%

To the best of your memory, which notifications did you receive? (Select all that apply)

- Low grade relative to your classmates: 18%
- Low page views relative to your classmates: 45%
- Haven't logged into the course in a few days: 50%
- I don't remember: 18%
Was being notified about having a relatively low grade and the suggestion to react...

Yes, it helped me to remember to check my grades where I found some glitches.

Was being notified about having relatively low page views and the suggestion to...

It was sometimes confusing when I would receive notifications that I was behind my other classmates but I was following the scheduled lessons. Meaning that others were going ahead of the schedule but the notifications made me feel behind. If there was a way to get notified for being behind schedule instead of behind other students.

No, I wish there were more tips about how to succeed in the class rather than just telling me that I wasn't logged in as much as other students. Even if I were logged in 100X longer than other students that shouldn't have any causation regarding my grade.

Not really, I was aware that I didn't look at the page much but had made plans to work through it.

No because I did better than my classmates with the lower page view count. I don't think it was an accurate representation of my academic success. I would have liked notifications to pace my assignments and the course in general.

I was a bit surprised because I thought I was keeping up rather well with the coursework. It helped me spend more time because I was worried I was really behind - but I don't think I was ever as far behind as the notifications made it seem.
Was being reminded to log into your course helpful to you? Please elaborate.

Yes, because different days of the week was given to an assignment and if I began to slack off it was easy for the work to pile up.

It was too often and often felt like spam.

No.

No.

It helped me keep my schedule consistent.
Notifications were sent on Fridays. Was that an ideal day? Please elaborate.

Yes

sure

Monday would be good too

yes, a good reminder day as most assignments were due on saturday

It was nice to have an end of the week summary with upcoming dates for the next week.

Some assignments were due Saturday.

As long as I got notifications in advance of when things were due I didn’t care what day.
At the end of the first week of class, a reminder to check one’s syllabus along with a link to t…

Q12.8_TEXT - Other

Other

I honestly don’t remember.
At the midway point, a reminder to work on big assignments early was sent along with a link ...

Q13_3_TEXT - No

No

I honestly got tired of the notifications and just stopped looking at them. I just organized myself to stay ahead.

I didn't watch it

I never got a link for a TED talk. I would have loved that.

Don't remember receiving such a notification

I would like course specific notifications instead of a general, “Keep working” one

Other

Other

I am not remembering that email.

I don't. Remember this

I do not recall.
<table>
<thead>
<tr>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>I don't remember this either.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>What notifications or tips would have been helpful?</th>
</tr>
</thead>
<tbody>
<tr>
<td>What notifications or tips would have been helpful?</td>
</tr>
<tr>
<td>I think just reminders of big assignments being due</td>
</tr>
<tr>
<td>Only notifications the day something is due or happening.</td>
</tr>
</tbody>
</table>
Percent of LRS Respondents who Triggered Tips

- Learner Control (n=3,188) 36.5%
- Online Communication (n=3,198) 36.5%
- Self-Directed (n=3,178) 28.4%
- Computer/Internet (n=3,165) 14.2%
- Motivation for Learning (n=3,193) 14.0%
- Accessibility (n=3,319) 13.5%
What are your motivations for taking the online or blended versions of the course? (n=3,298)

- Flexibility: 61.1%
- Scheduling: 60.0%
- The class is only offered online or blended: 18.8%
- Accessibility: 13.6%
- I prefer online learning: 8.9%
- Other: 6.0%
Class Standing

<table>
<thead>
<tr>
<th></th>
<th>Interventions</th>
<th>Control or no LRS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring Fresh &amp; Soph</td>
<td>3.3</td>
<td>2.91</td>
</tr>
<tr>
<td></td>
<td>n=31</td>
<td>n=156</td>
</tr>
<tr>
<td></td>
<td>3.59</td>
<td>3.38</td>
</tr>
<tr>
<td></td>
<td>n=140</td>
<td>n=630</td>
</tr>
<tr>
<td></td>
<td>3.18</td>
<td>3.31</td>
</tr>
<tr>
<td></td>
<td>n=33</td>
<td>n=91</td>
</tr>
<tr>
<td>Summer Fresh &amp; Soph</td>
<td>3.43</td>
<td>3.32</td>
</tr>
<tr>
<td></td>
<td>n=116</td>
<td>n=354</td>
</tr>
</tbody>
</table>
Appendix H: Project Management

Budget:

<table>
<thead>
<tr>
<th>Who</th>
<th>Total Estimated/Actual Hours</th>
<th>Total Estimated/Actual Dollar Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carolyn Andrews, PhD candidate, BYU Online Program Administrator</td>
<td>135/155</td>
<td>$4,860/5,580</td>
</tr>
<tr>
<td>Laura McAllister, BYU Online Courses Administrator</td>
<td>67/80</td>
<td>$2,077/2,480</td>
</tr>
<tr>
<td>Kirk Parry, BYU Online Courses Administrator</td>
<td>67/85</td>
<td>$2,077/2,635</td>
</tr>
<tr>
<td>Elizabeth McIntire, BYU Online Student Employee</td>
<td>30/50</td>
<td>$ 360/600</td>
</tr>
<tr>
<td>Rachel Sherman, BYU Online Student Employee</td>
<td>75/75</td>
<td>$ 900/900</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>374/445</strong></td>
<td><strong>$10,274/12,195</strong></td>
</tr>
</tbody>
</table>
Timeline:

<table>
<thead>
<tr>
<th>Phase I: Development of the solutions informed by existing intervention strategies and technological innovations.</th>
<th>Draft intervention communications based on principles in the literature. From the literature collect intervention strategies that other researchers have suggested.</th>
<th>Produce draft intervention strategies, select appropriate technologies and plan and create a solution to be implemented.</th>
<th>09/01/18-10/31/18 On track</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase II: Identify algorithm to identify at-risk students.</td>
<td>Draft algorithm to use in identifying at-risk students.</td>
<td>Produce final algorithm to be used in identifying at-risk students.</td>
<td>09/01/18-10/01/18 On track</td>
</tr>
<tr>
<td>Phase III: Institutional Review Board (IRB) Paperwork</td>
<td>Draft IRB paperwork</td>
<td>Finalize IRB paperwork and submit</td>
<td>09/24/18-10/15/18 Decided to go a different route - this is on hold for a future study</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Phase V: Prepare to pilot intervention Winter semester 2019</td>
<td>Draft communication to faculty regarding pilot intervention Winter 2019</td>
<td>Finalize faculty communication and send out.</td>
<td>11/15/18-12/01/18 Decided to go a different route - this is on hold for a future study</td>
</tr>
</tbody>
</table>
References


How to Prepare an Annotated Bibliography: The Annotated Bibliography (2019, Feb 26). Retrieved from https://guides.library.cornell.edu/annotatedbibliography


