The purpose of this study was to evaluate student perceptions of different online course delivery methods. In order to develop the experimental course delivery method, the researchers used universal design for learning (UDL) guidelines as a theoretical framework. Responses to pre- and postsurvey items provided data to examine whether an online course developed using UDL principles afforded a more positive learning experience. This study provides online student perceptions that indicate the online learning environment developed with the UDL framework is preferred by students.

INTRODUCTION

Enrollment in online courses has reached an all-time high of 7.1 million students nationwide since 2013, with the proportion of students taking at least one online course rising to 33.5% (Van Rooij & Zirkle, 2016). The increase in online enrollment is especially prevalent among individuals pursuing an advanced degree in the field of teaching. According to the National Center for Education Statistics, in 2015-16 34.3% of graduate students pursuing a degree in education were enrolled in a fully online degree program (2018). In addition, as many as 58.2% of graduate students in the field of education were enrolled in at least one online course (Digest of Education Statistics, 2018). Rapid growth in online learning indicates that teacher educators and their course delivery methods must evolve with their growing digital student population.

In response to the reality that fully online course delivery is becoming a standard delivery method within institutions of higher education, we conducted a study with the purpose of evaluating student perceptions of different online course delivery methods. In order to develop the experimental course delivery method, we used universal design for learning (UDL) guidelines as a theoretical framework.

The study was submitted to and approved by the university IRB committee, and informed consent was obtained from all individual participants in the study and was approved by the university IRB committee. This study was developed in response to the following questions about online course delivery methods:

- What are students’ perceptions of online courses designed and delivered using universal design for learning principles?
- What are students’ perceptions of a consistent online course delivery method across an entire degree program’s course offerings?

THEORETICAL FRAMEWORK

The theoretical framework for this study was developed using the principles discussed in “Providing New Access to the General Curriculum: Universal Design for Learning” (Hitchcock et al., 2002). This seminal work defines the importance of developing a curriculum that is accessible and productive for all students. The literature addresses the issue of barriers in the curriculum and states that the flexibility created by UDL will create a course that is designed for all learners to be successful. Universal design for learning is defined by the Higher Education Opportunity Act as a guiding educational practice that:
• provides flexibility in the ways information is presented, in the ways students respond or demonstrate knowledge and skills, and in the ways students are engaged; and
• reduces barriers in instruction, provides appropriate accommodations, supports, and challenges, and maintains high achievement expectations for all students, including students with disabilities and students who are limited English proficient (2008, 122 Stat. 3088).

In seeking to adapt UDL principles to online course delivery, the theoretical framework was expanded to include literature that studied best practices for UDL in online course development. To create flexibility and reduce barriers in the online course we focused on three techniques used to adapt UDL to online course delivery.

The first technique was to provide students with consistent and immediate access to course resources and information with the goal of reducing the barriers in many online courses (Carnahan et al., 2016). The next technique was to reimagine the way content was presented in the online course. The content presentation was approached through using the UDL principle that providing flexibility and accessibility in presentation of content enhances the learning environment (Al-Azawei et al., 2016).

Finally, keeping in mind that implementing UDL principles in the online classroom would reduce barriers to all learners, the next step was to consider creating a consistent online template for all courses in a program catalog. This change predicted that after students had taken at least one course that contained the consistent design template, the students would face fewer barriers during the first few weeks of instruction. The goal of the template was to reduce cognitive overload, which typically accompanies the acclimation period of a new online course. Cognitive overload is reduced because the student has already been acclimated by a previous course that used the same design. This change expanded the UDL benefit of keeping the student focused on learning the course content and not focused on finding the course content (Robinson & Wizer, 2016).

**REVIEW OF LITERATURE**

Before developing the experimental online course delivery method, a review of literature was conducted in the areas of availability of resources, content presentation, and programmatic course consistency as they pertain to best practices for online course delivery and development.

**Availability of Resources**

According to a 2008 study, students do not know what to expect or even how to behave in an online course setting (Dykeman & Davis, 2008). This observation shows a need for instructors to provide students with an opportunity to orient themselves to the online course before beginning the semester’s activities and assignments. A course specific orientation could be provided to guide students toward accessing important course documents, course tools, and appropriate technology.

It is also important for students to have immediate access to specific software resources and technical help because students lacking regular access have greater difficulty succeeding in online courses (Schrum & Hong, 2002). Institutional policies, such as those related to accommodations for students with disabilities, should also be included (Dell et al., 2015). Making technology and course specific resources readily available to students creates an environment wherein they can be successful.

**Content Presentation**

Online content presentation is a topic that might conjure a wide array of instructional ideologies, and many different course design styles may impact student success. Dykeman and Davis (2008) found that following a regular modular structure throughout an online course helps to establish and sustain the pace of the course and makes it easier for students to keep track of what is due and when. Specifically, this means that students prefer it if course materials are grouped in units based on timing and topic (Borgen, 2013). When developing the course, the module content should flow from the course learning objectives (Collins et al., 2014). The content within the modules should follow these same principles, with each learning module containing a wide variety of learning activities and resources grouped by learning objective (Simonson, 2015).

Modular construction also includes multimedia items grouped together by topic with video resources embedded within the learning management...
system to create an active learning environment (Tantrarungroj & Feng-Qi, 2011). Curating all content within the course modules may also keep the student engaged in the topic of study by providing all the relevant content in one specific place and preventing the need for the students to venture away from the online classroom.

Programmatic Course Consistency

Students enrolled in a graduate level program may see a wide variety of course design methods in use throughout the completion of their coursework. In this environment, students must invest additional time, effort, and cognition to orient themselves to each new course (Dykeman & Davis, 2008). Implementing programmatic course consistency in navigation and nomenclature could ease the student’s transitional cognitive load from course to course. Standardized course navigation enables students to focus on learning rather than figuring out how to navigate each new course site and makes it easier to transition from one course to another (Collins et al., 2014). Recent studies on the implementation of universal course design templates indicated an increase in student retention and graduation in the short term (Borgemenke et al., 2013). These findings encourage exploration into implementing a consistent programmatic online navigation.

METHODS

Participants

The participants consisted of 55 graduate students enrolled at a Southern, public university. Nineteen students were enrolled in a Master of Arts in Teaching (MAT) degree program and 36 students were enrolled in either the teacher leadership or school counseling program. The MAT participants were enrolled in two sections of a disciplinary literacy course taught online during the summer. One section (control) was taught during the first five-week summer session (N = 13) and one section (experimental) was taught during the second five-week summer session (N = 6). The other participants were enrolled in two sections of a learning and development course taught online during the summer. One section (control) was taught during the first five-week summer session (N = 20) and one section (experimental) was taught during the second five-week summer session (N = 16). While this sample size is small due to the number of students available to be studied at the time of this project, the investigators believe that the results can be used to make meaningful adjustments to the way online courses are designed and aligned within these specific graduate education programs.

Procedures

The experimental course was developed based on the findings of the literature review, while the control course was taught as it had been for several semesters. The course content, assignments, and overall rigor did not change from the control course to the experimental course.

Participants were asked to complete a presurvey before their course began. The presurvey consisted of questions related to prior experience taking online courses. Participants were asked to complete a postsurvey on the last day of their course, which consisted of questions related to the students’ experiences in the experimental course.

The presurvey consisted of four questions related to the students’ previous experience locating information and four questions related to the students’ previous experience with consistency between courses in their online graduate program. The responses were presented on a Likert scale and the possible responses related to locating information were as follows: easy, somewhat easy, neutral, somewhat difficult, and difficult. The possible responses related to consistency were as follows: very consistent, consistent, neutral, somewhat consistent, and not consistent.

The postsurvey consisted of the four questions related to the students’ experience in their assigned course in locating information. The responses were reported on a Likert scale and the possible responses related to locating information were as follows: easy, somewhat easy, neutral, somewhat difficult, and difficult. Additionally, the postsurvey questioned the organization of the current course. The responses were presented on a Likert scale and the possible responses related to current course organization were as follows: not well, fairly well, well, and very well.

Design of Course Shells

In redesigning the course shells, the researchers sought to provide the experimental group immediate access to important resources and orient them to the course. This process began by creating a course specific home page called Getting
Started. In the control course the home page was called Information, which contained all course documents including the syllabus, course calendar, all assignment instructions, article resources, video resources, and rubrics. In the experimental course the Getting Started page acted as the home page for the course and included only the documents students needed to access on a regular basis. These documents included the syllabus, course schedule, a course navigation overview, and a new instructor information item that provided students with a short biography of the instructor, their preferred method of communication, and virtual office hours. The creation of this page gave immediate access to important course specific documents and resources and removed the additional clutter contained within the Information page.

The next addition to the experimental course was a content page called Online Essentials, which was a robust listing of institutional, student, and technology resources. These resources included technical support websites and direct phone numbers to the learning management system support and university help desk, university policies about academic integrity and disability resources, free software downloads available to students, and device compatibility statements. The Online Essentials page served as a student support hub and gave students access to information about technology and policies needed to participate in online classes at the university. Students used the Online Essentials page to find immediate answers to technical questions that might otherwise have to wait for an email response. This kept the students engaged in the course content by removing the wait time for answers to common technical issues.

The final endeavor to redesign the experimental course so it focused on the course content presentation. The control course used a page called Content that listed all course assignment submission links. This was separate from the assignment instructions and could be found under the Information page. The experimental group utilized a modular structure for the course assignments and content organized within a content page called Online Classroom. The modules were separated into several folders by topic and timing. Each folder was labeled with a date range that indicated to the students when to be working within each module. A schedule found within each module, in addition to the date range in the module title, helped the students with pacing throughout the course. Each module contained all the information, content, and assignments that students would be responsible for during the stated date range.

The initial module within the Online Classroom page was called Module 0 and was scheduled to be completed during the first week of the course. This module acted as a course specific orientation for the students. Within the module, the students again found the syllabus, the course schedule, and the descriptions of all major projects and assignments. This module also included a Sharable Content Object Reference Model (SCORM) package that unpacked the syllabus and important course information in a self-guided interactive tutorial. Module 0 concluded with a quiz that was developed as a low-stakes, high-opportunity way for the instructor to ensure that the students were properly oriented to the course. The quiz contained 10 questions focusing on the most important aspects of the course specific orientation, the Online Essentials page, and the Getting Started page. Students were given an unlimited number of attempts to earn the 10 points associated with the quiz. The quiz gave the students an incentive to read these important course documents, visit the resource pages, and take part in the interactive tutorial while giving the instructor a way to gauge their understanding of the course orientation materials.

Finally, the content presentation within the modules was redesigned. The goal of the content presentation was to keep the students engaged and working within the learning management system as long as possible. This change included embedding video content within the module folders as opposed to linking to external websites like TED or YouTube, grouping other course content such as articles, and reading by topic. Assignment resources like instructions, rubrics, and templates were also grouped within the description of the assignment submission so students did not have to leave the module folder to find necessary assignment information and resources. This format helped students streamline their approach to each assignment by providing everything needed to complete the assignment in the same place where they submitted them. This new approach was a deviation from the control course where students navigated back and forth between the Information
The results of the presurvey indicated that the online program was not doing an adequate job in terms of consistency between courses as 55% reported the program lacked consistency (not consistent or somewhat consistent) in locating course information, 35% reported the program lacked consistency in locating assignment information, 58% reported the program lacked consistency in locating assignment submission information, and 58% reported the program lacked consistency in locating grading information (see Table 1).

The results of the presurvey indicated that when asked how to design the perfect online course in the open-ended portion of the presurvey, 58% of participants responded that the course must be well organized, 11% suggested grades should be easily accessible, 11% suggested including learning modules, 8% suggested the use of screencasts, and 8% suggested the exclusion of group work. Additionally, 67% of participants indicated that organization was a key factor in creating ease of access in online course shells (see Table 3).

The results of the postsurvey showed little difference between the control course and the experimental course regarding...
ease of access (easy or somewhat easy) in locating course information and assignment information: 83% was reported for both areas in the control group and 84% was reported for both areas in the experimental group. However, the experimental group reported larger differences in the other two areas: 77% of the control course students reported it was not difficult (easy or somewhat easy) to find assignment submission information as compared to 97% reported by the experimental group, and 84% of the control course students reported it was not difficult (easy or somewhat easy) to find grading information as compared to 100% of the experimental group (see Table 4).

Course features. The revised course shells used by the experimental group contained elements not found in the control group’s courses. Those included an Online Essentials tab, a Getting Started tab, a Module 0, and having the course divided into weekly learning modules. The experimental group found these additions to be very helpful: 76% of participants found the Online Essentials tab helpful, 87% found the Getting Started tab helpful, 83% found the Module 0 helpful, and 83% found the addition of learning modules helpful (see Table 5).

Table 5. Did you Find These Course Features Helpful?

<table>
<thead>
<tr>
<th>Feature</th>
<th>Control Group</th>
<th>Experimental Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online Essentials Tab</td>
<td>76%</td>
<td>87%</td>
</tr>
<tr>
<td>Getting Started Tab</td>
<td>87%</td>
<td>83%</td>
</tr>
<tr>
<td>Module Zero</td>
<td>83%</td>
<td>83%</td>
</tr>
<tr>
<td>Learning Modules</td>
<td>83%</td>
<td>83%</td>
</tr>
</tbody>
</table>

Organization. When asked how well the course was organized, 49% of the control group reported that the course was organized fairly well or very well, and 79% of the experimental group reported that the course was organized fairly well or very well, while 31% of the control group reported that the course was not well organized, but only 4% of the experimental group believed the course to be not well organized (see Table 6).

Table 6. How Well was this Course Organized?

<table>
<thead>
<tr>
<th>Rating</th>
<th>Control Group</th>
<th>Experimental Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Well</td>
<td>18%</td>
<td>58%</td>
</tr>
<tr>
<td>Fairly Well</td>
<td>31%</td>
<td>21%</td>
</tr>
<tr>
<td>Well</td>
<td>19%</td>
<td>17%</td>
</tr>
<tr>
<td>Not Well</td>
<td>31%</td>
<td>4%</td>
</tr>
</tbody>
</table>

Consistency. For both control and experimental groups, 84% reported a desire for program courses to contain consistency between courses (see Table 7).

Table 7. Would it be Helpful if all Your Courses Used a Consistent Format?

<table>
<thead>
<tr>
<th>Response</th>
<th>Control Group</th>
<th>Experimental Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>84%</td>
<td>84%</td>
</tr>
<tr>
<td>No</td>
<td>16%</td>
<td>16%</td>
</tr>
</tbody>
</table>

DISCUSSION

Based on the results of the pre- and postsurveys, students indicated that the experimental course was easier to navigate, more organized, and contained features that were helpful to them. These features were designed to align with the Universal Design for Learning principles of increasing flexibility and reducing barriers for students, and the results seem to suggest that this was the case. The survey results indicate that the students preferred the course that was designed based on the UDL principles discussed in the theoretical foundation portion of this paper.

The survey results also indicate that the majority of students enrolled in this graduate education program preferred more consistency from course to course. Students’ perceptions of consistency from course to course was studied with the UDL principle of reducing barriers in mind. While this study could not assess whether programmatic course consistency reduced barriers to students in the program, the results of the survey indicate that students felt that it would be beneficial.

The overall results of the study suggest that designing online courses individually and programmatically that align with Universal Design for Learning principles creates an environment that is productive for all students.

CONCLUSIONS

Presurvey results indicated that the graduate teacher education programs were doing an adequate job of providing easy access to information in their online courses. However, respondents indicated that there was a lack of consistency between the online course formats. A review of the open-ended responses show that students valued an organized online format and would like to have more format consistency between their online courses.

These results are consistent with the benefits
that come with programmatic course consistency. Students want to be able to easily navigate through each new course within their program of study. Students find that when courses share similar navigation, this is accomplished. Having similar course navigation across a program allows students to focus their efforts more on the course content and less on the course navigation.

The postsurvey results indicate that the revised online format presented to the experimental group provided greater ease of access and was better organized. The addition of new tabs and modules was also overwhelmingly popular. In the open-ended portion of the postsurvey, students again expressed a desire for consistency between course shells within the program.

LIMITATIONS
This study did have limitations. The study was limited in that it was conducted with only two classes from two online programs at a Southern, public, state university. It was also conducted during a summer term, which limited the length of interaction. These factors might reduce the generalizability of the results.

RECOMMENDATIONS FOR FURTHER STUDY
Students reported that the revised course shells were easy to access and were better organized, and the added features were appreciated. Further study needs to address other features that might also benefit online format construction. Additionally, students repeatedly expressed a desire for consistency between course shells within their online program of study. Further study needs to address the reasons online programs are not consistent and how to encourage online programs to seek consistency.
REFERENCES


