**Reaching students in online courses using alternative formats**

**Abstract**

This research was conducted to explore whether students enrolled in graduate level courses found selected Universal Design for Learning (UDL) strategies useful and if they actually used them. The strategies we investigated were presenting course information in alternative formats including PowerPoints with voiceover, screencasts and videos as an alternative to text resources. In addition, students were invited to submit assignments in alternative formats as well as text. To examine these strategies, we used a student questionnaire, analytics from Blackboard and assignment formats students used. The results indicate that text was the preferred format for accessing course information and resources as well as assignment submission. However, a substantial number of students acknowledged the benefits of using alternative formats and a smaller percentage used them. We suggest that instructors take advantage of UDL strategies since a sufficient number of students used them and because learning styles differ. We can reach more students by using these strategies.

**Keywords:** Universal Design for Learning (UDL), eLearning, Learning styles, multiple means of representations, Alternative formats

**Literature review**

Online learning is rapidly expanding in the educational setting. In this context it is important to investigate teaching methods that address diverse learning styles. While it is always challenging to create a learning environment that meets all students’ learning needs, it can be even more so in an online course. In our experience and that of colleagues we have found that because we do not have the visual and physical cues that are present in face-to-face classes, we need to deliberately seek out feedback from online students to ascertain that we are reaching them.

Use of Universal Design for Learning (UDL) can support classroom learning for students with special needs as well as meet various learning styles of typical learners (Rose & Meyers, 2002). In an online setting UDL means that students are provided with multiple ways of accessing information (Dahl, 2005;Thormann & Zimmerman, 2012) and multiple ways of demonstrating what they have learned (Passman & Green, 2009; Thormann & Zimmerman, 2012).

A theoretical paper by Chita-Tegmark, Gravel, Serpa, Domings, and Rose (2011-2012) suggests that use of a UDL framework can help to enhance learning for culturally diverse students. With the growing number of virtual schools and concerns about accessibility of online materials Hashey and Stahl (2014) present resources to evaluate accessibility of online learning materials. Concrete strategies to incorporate UDL for students enrolled in online courses are presented by Tobin (2014). Using some UDL strategies can enhance learning for a wide range of students.

Incorporating time consuming UDL strategies seems like a good idea. However, Edyburn (2010) observed that most of the literature concerning UDL is based on expert opinion and praxis. Thormann (2013a, 2013b) conducted research that provides some evidence that students view UDL strategies as useful in their online learning experience. As an instructor, she also found that using alternative formats to present material increased the preparation time as well as the amount of time it took to evaluate assignments.

Another aspect that is embedded in the UDL approach that emerged was that there is a relationship between students’ preferred learning styles and their use of alternative formats. Mohr, Holtbrügge and Berg (2012) used Kolb’s (1984) learning style inventory to find out how students perceived various e-learning methods. They concluded that “…various forms of e-learning are becoming more and more important…” and their research contributes to the understanding of guiding “…educators to adjust the choice of e-learning tools in their teaching to make sure that learners fully benefit from e-learning.” Findings of a study concerning students’ selection of an online versus face-to face course based on learning styles showed there was no statistically significant difference (Zacharis, 2011). This study also found no difference in course performance. Zacharis indicated that in both versions of the course, learning activities were varied. Using the Felder-Soloman’s learning style inventory, Saeed, Yun Yang and Sinnappan (2009) found that students learning style influenced the instructional technology tool they preferred. Rogowsky, Calhoun & Tallal (2015) studied the effects of using preferred learning styles (auditory or visual word) with adult learners. They found no statistically significant difference in learning aptitude. The results of these studies are mixed. This may be in part due to the using different instruments to assess learning styles.

For over two decades U.S. schools and universities must comply with laws that require access to education including access by those students who have print disabilities (Senge & Dote-Kwan, 1995). Online educators generally agree that providing content in multiple formats can address various student learning styles (Thormann & Zimmerman, 2012;Vasquez, 2005) Earl (2013) conducted a study to assess student views about “short-text assignment formats include abstracts, magazine articles, pamphlets, letters, poems or posters.” Students found that this type of assignments provided variety, possibilities to be creative and potentially useful.

This study addresses the need to have more research based evidence of whether or not alternative formats for resources and assignment submission are used by students and if these strategies are perceived by students as helpful in the learning process.

**Research questions**

We wanted to assess preferences regarding use of alternative formats by graduate students who were enrolled in online courses. Our research questions include the following:

* Which alternative formats do online students prefer to use to learn content? Why?
* Is there a relationship between the students’ preferences about alternative formats and the course content?
* Which alternative formats do students view more frequently?
* When given the option to use alternative formats for submitting assignments what do students choose to do?

Based on UDL principles, different formats were selected to deliver course content in multiple ways and students were allowed to submit their assignments in alternative formats. We did not incorporate all UDL principles in this study but only focused on use of alternative formats for directions, overviews and content. This study was conducted to help build research based evidence to the claims that UDL principles such as use of alternative formats are beneficial for students with and without special needs. The idea of using alternative formats is not new (Thormann & Zimmerman, 2012;Vasquez, 2005; ), however very few studies have been conducted from the student’s perspective.

**Methodology**

**Setting.**

This research was conducted in two eight week online courses offered to graduate students in the fall of 2014 and spring 2015. The 2014 course was ECOMP 6204 *Online Teaching: Course Design, Development, and Strategies,* which is the capstone course in a 5 course Advanced Professional Certificate in Online Teaching**.** This course provides the opportunity to synthesize components of online teaching by involving participants in the development of an online course. Content and age appropriate online activities and strategies that engage future students are studied and developed. Educational theory, best practices in online learning, principles of Universal Design for Learning (UDL) and use of emerging technologies are researched, analyzed and used to produce online lessons that are viable and engage students in authentic learning.

The spring 2015 course was ECOMP 6201 *Online Teaching: Introduction to Design and Practice*,the first course in the certificate sequence. This course is designed to introduce online teaching to educators. Using a constructivist learning approach, we explore the pedagogy and best practices for teaching and learning online. Helping students assess their readiness to learn online and addressing needs of diverse learners are investigated. An understanding of professional standards and using various online tools are gained. Solutions for building community and facilitating discussions are practiced to keep students motivated to produce quality work in the online environment.

Blackboard was the learning management system (LMS) that was used.

Chen (2015) wrote “Learning style discusses learners’ personal differences in preferences to receive and process information during instruction (Aragon, Johnson, & Shaik, 2002).” We use this broad definition of learning style and operationalize it in presenting course content to include various formats including text, PowerPoint with voiceover (visual and auditory), YouTube videos (visual and auditory) and screencasts. The screencasts used is a video screen capture with audio narration.

The voiceover could be turned on for each slide if the student chose to do so. The voiceover consisted of reading the text on the slides. The PPT text was exactly the same as text only. An overview of the week was presented in a screencast with a graphical PowerPoint and the instructor reading the text in the fall 2014 course. In the spring 2015 course, both text only and screencast overview formats were offered. Both classes had screencasts but only one had both text and screencasts. In addition, two resource formats were available; one with articles relating to the weekly content and the other with YouTube videos relating to the content. Both articles and videos were selected by the instructor. The YouTube video presentations varied. For example, some were animations, others were lectures with slides and others were interviews with experts. Typically for each assignment students were required to read two articles and/or view videos. Essentially alternative formats presented the same content as the traditional text format.

In the first weeks of both the courses the focus was on introductions and ice-breaking activities and thus there were no articles or videos.

In addition to presentation of content in alternative formats, students were invited to submit their assignments in any format they chose. This allowed them to use their learning strengths in the assessment process. There were three overarching guidelines to submit assignments in an alternative format. The format that students used needed to be easily accessible to everyone in the class, all components of the assignment needed to be included and APA citations needed to be used. These guidelines were communicated in text, PowerPoint with voiceover and in a one-to- one Skype meeting between the instructor and each student during the first two weeks of the course. During this Skype meeting the instructor also pointed out that assignments and resources were available in alternate formats.

**Participants.**

There were nine students enrolled in the fall semester 2014 and 18 students in the spring 2015 course. One student in the fall group completed only the first assignment. Thus the total number of students completing the two courses was 26. Most students were K-12 teachers throughout the United States earning either their M.Ed. and/or an Advanced Professional Certificate in Online Teaching. One student was a teacher in Asia.

Eighteen of the 26 students responded to the questionnaire. Six students in the fall 2014 course and 12 in the spring 2015 course completed the questionnaire.

This study did not focus on students with special needs. None of the students contacted the office of Disability Services to document a disability. However, two students informally indicated that they had a disability. In addition, the instructor noted that at least two other students may have had some learning difficulties. Since the courses were at the graduate level, students who were enrolled have potentially compensated for their special needs. Data that was collected and analyzed did not address whether students did or did not have a disability. UDL strategies can apply to all students since learning differences apply to all students.

**Data Collection.**

The methodology used for this study was mixed method. An analysis of statistics gathered from Blackboard was performed. To gather data from the LMS, each alternative format resided in a separate folder. This allowed us to access student usage data from Blackboard. A report with the “Number of Times Accessed” data was produced by the LMS. The Blackboard data and submission formats served as a means of observing students format preferences.

Another measure involved counting and listing the different ways students submitted their assignments in order to look at the frequency of text versus alternative formats. This was done by viewing each assignment that was submitted and noting what type of format was used.

In addition, a questionnaire was constructed and was completed by 18 of the 26 students after they finished their course and grades were submitted. The questionnaire asked which formats students preferred for understanding course assignments and course content, why they chose to submit assignments in a particular format, if the subject matter influenced their selection of the format and if the varied formats helped them. We also asked what they consider their preferred learning style to be, in order to find out if their actual usage of the various formats was aligned with their stated learning style preference. The final question asked permission to use their responses for research purposes. For most of these questions we ask the rationale for their responses. Data gathering occurred from December 20, 2014 through May 31, 2015.

**Limitations.**

The number of students enrolled in the courses determined the size of our study. It would be useful to replicate this study with a larger number of students to validate the results we found in this research.

To collect Blackboard usage data we were obliged to make separate sub-folders for each format. Assignment directions were in separate folders for the text and PowerPoint with voiceover versions. Required YouTube videos were in a separate folder. We did not however, place links to required readings in a separate text assignment folder but included articles to be read along with the text and the PowerPoints versions of the assignment directions. As a result the number of times the text assignments that were accessed may be inflated versus accessing videos. We did not make a separate folder for articles because we did not want to ask students to spend excessive time to find resources.

The number of hits on each one of the resources available to the students does not provide information about if they actually read, listened and/or saw those resources and its content. The students could have downloaded the files on their computers and there is no way to find out what they actually did with those files.

In the fall 2014 course we developed and presented a weekly overview using a screencast only. In the spring 2015 course the overview was presented in a screencast format and a separate text format. Omitting text in the fall 2014 class was an unintentional oversight. Both formats should have been available.

**Ethical Considerations.**

The course content and presentation was slightly altered for this research project. Most of the accommodations were used in previous courses. There were two additions which were screencasts with a weekly overview and use of YouTube videos as an alternative to articles. Both of these accommodations were enhancements that students could use if they wished, but were not required to do so.

Questionnaires were sent to students after the course was completed and responding to the questionnaire was totally voluntary and anonymous.

Students were not subjected to a course with an experimental design that might have negatively affected their learning or performance in any way. No student names and/or identifying information are revealed is this study.

**Results**

**Blackboard Analysis.**

An analysis was done of the number of hits that each student performed on Blackboard on the assignment directions and available resources of the course. Text and PowerPoint assignment directions were identical in content. The videos were about the topic of the assignments and placed in a separate folder. As explained in the methodology section, during the fall 2014 course screencasts with an overview of the week were available while in the spring 2015 course the content of the weekly overviews were available in both screencasts and text. The purpose of this analysis was to find out which formats students consulted most often.

In the fall 2014 course, the total number of hits per format was: 418 for text resources, 63 for PowerPoints, 12 hits for Screencasts and 115 for videos (Figure 1).

Figure 1 Fall 2014: Total # hits per format

An analysis of the preferred formats for assignment instructions that students of fall 2014 accessed showed that text was the format with the most hits (Figure 2). The number of hits for text instructions was always much higher than in the other formats . Students preferred text over PowerPoint with voiceover. In addition, a substantial number of hits (115) were seen for videos.

As can be seen in Figure 2 for all the assignments, text was the format with the most hits. PowerPoint with voiceover always had fewer hits. Videos about the content for assignments #2, #3 and #6 were accessed more frequently than other assignments.

Figure 2 Fall 2014: # of hits by formats and assignments

The instructor also recorded a screencast with an overview of the course content for each week. An analysis was performed on the number of hits that screencasts had (Figure 3). On six of the seven assignments the screencast only had one hit while on assignment #3 it had eight hits. This may have been because by the third assignment the instructor specifically alerted students about the availability of the screencasts.

Figure 3 Fall 2014: # of hits on the weekly screencasts

The same three analyses were performed on the spring 2015 course. The total number of hits per format was: 1485 for text resources, 107 for PowerPoints, 63 for Screencasts and 580 hits for videos (Figure 4). Again the text format had the highest number of hits (almost three times more than the second format with more hits, the video format).

Figure 4 Spring 2015: total # hits per format

An analysis of the preferred formats of the students to access the assignment instructions (Figure 5) showed that the text was the format with the most hits for almost all the assignments (exception for assignment #4). The number of hits for text instructions was always much higher than in the other formats (at least five times higher but most of the times even more).

Assignments #1, #2 and #5 did not have the video format as an option for students to consult. Assignment #4 had the greatest number of hits because students were required to view videos for this assignment.

Figure 5 Spring 2015: # of hits by formats and assignments

For the spring 2015 course the instructor also made available screencasts of course content for that week as well as a text format. The results show (Figure 6) that the format with more hits was the text format although both formats had a decreasing number of hits over the eight week duration of the course (except for weeks 4 and 8 for the screencast format and week 8 for text).

Figure 6 Spring 2015: # of hits on the weekly screencasts and texts

**Questionnaire.**

The questionnaire had 10 questions: nine about students’ preferences and opinions and one question (#10) asking consent to use the data for research purposes. The first question asked students to rank their preferred formats for finding out what directions and background for the assignments were. Figure 7 shows that the text format was selected as their first choice by most of the students (78%) from the fall 2014 and spring 2015 courses followed by PowerPoint with voice over (16%). The screencast format was the first choice of only one of the respondents (6%).

Figure 7 Preferred formats of the fall 14 and spring 2015 students

The second question was open ended and queried students about their motives for the answers given in question #1. The students that chose text as their preferred format gave responses such as “With text, I had the expectations, instructions, and due dates all on one page in front of me. I could print it out if needed or just save it and refer back to it” or “I liked to print out the text and put in a binder that way if I was not near my technology and internet I was still able to access what work I needed to do for the week.” Another respondent wrote “Having the text version of an assignment provides me with a sort of "checklist" that I can easily reference to make sure that all parts of the assignment are complete.” Regarding the preference for PowerPoint one respondent wrote “I used a combination of the text and the PowerPoint. Whenever there was too much text for my brain to process, I would look through the PowerPoint. Having the information broken up in slides helped sort out what was required of me.” The preference for PowerPoint with voiceover was described by another respondent: “I work best when information is explained in chunks rather than all at once. Being able to have the PowerPoint separated the information into pages which helped me create a timeline of things to do.”

The next question asked students which format they preferred to access the course content (i.e. articles and videos). Most students from the two courses said they preferred YouTube videos (Figure 8).

Figure 8 Preferred formats of the fall 2014 and spring 2015 students

Figure 9 shows the answers to question #4. Most of the respondents of the two courses said the course content and subject matter did not influence them in the choice of format.

Figure 9 Fall 2014 and spring 2015 influence on format choice

The next question was open-ended and inquired about students’ reasons for their response to question #4. Four students from the fall 2014 course responded that the course content and subject matter did not influence them. “This was more about my preferred learning style than it was about the content or subject matter” stated one of the respondents while another wrote “I somehow found the articles that had long research to have a lot of extraneous information and that the videos were more tailored to the learning.” The two respondents from the fall 2014 course that answered “yes” presented comments such as “I needed the information in a quick and easy format to refer back to easily as a checklist for this course” and “I like to be able to back up when I need to understand key points.” From the *spring 2015* course six students answered that the course content and subject matter did not influence them while six students said the opposite. “The content and subject did not influence my choice, because once I got comfortable in how I was viewing information, I stuck with that.” was one of the responses while another wrote “Depending on the subject- I thought using visuals would create a better ending product.”

Question #6 was also open-ended and asked about the preferred format for submitting assignments and the reasons for that choice. Most of the respondents from the two courses said they preferred the text format although the reasons varied. “I preferred text, but if I was not working full time, I would have used the other formats for sure.” while another responded “Text just because that is what I was used to from other classes.” Another student wrote “If time allowed, I always like to use presentation tools like Prezi and VoiceThread. However, with my time constraints during the class, I used word/text mostly.” Another respondent shared the following “Text. Easier to get my point across. Less time consuming.” One student indicated that he/she doesn’t have a preference: “I like to try a lot of different options so that I know what tools are out there and how to use them.” Another respondent wrote “I frequently submitted text or a Prezi. Both options were quick, but it typically depended upon the organizational structure I was utilizing.” Other students did some experimentation regarding the formats: “Initially I preferred regular text format, but as we progressed through the class I thought it would be a nice challenge to use alternate means of presenting the assignments” wrote one of the students, while another wrote “I tried to use technology that I didn't know much about so I was able to learn by learning. :) I know how to use Word well, but I felt being able to know how to use other technologies would allow me to understand the challenges my students may have.”

Question #7 asked respondents to indicate their degree of agreement by completing the statement “I found having assignment directions, some resources and being able to submit work in alternative formats…” The scale provided had the following options: *very helpful, somewhat helpful, made no difference, distracting, not helpful* *at all*. As show in Figure most of the students from the two courses found it *very helpful* to have assignment directions, some resources and being able to submit work in alternative formats while three students found it *somewhat helpful*.

Figure 10 Opinion of the students from the fall 2014 and spring 2015 courses

Question #8 was open-ended and asked students about what other formats might have been helpful for presenting assignment directions and background and resources. From the fall 2014 course just one of the respondents shared another format (podcasts). The remaining answers referred to the formats used by the instructor during the course. “Due to the content of the course, I believe the 3 best choices were used to cover visual and audio learners” wrote one student while another wrote “I think that the variety that was offered was good. Not overwhelming, but allowed for choices.” Regarding the *spring 2015* course almost all of the students answered “none” or don’t know. There were no comments regarding other possible formats to present assignments.

Finally question #9 asked students what was their preferred learning style. Respondents could choose more than one option. Almost all respondents indicated that they were visual learners, a few kinesthetic and the only four that they were auditory learners. Eight of the respondents chose more than one learning style (Figure 11).

It should be noted that during a one-to-one Skype meeting with each student the instructor discussed learning styles with them. As part of the discussion, she presented them with three different learning style inventories. Almost all students did at least one inventory, some did all three. In the discussion with the individual students, most indicated that the inventory confirmed what they thought their learning style was. This provided us with an informed self-report of learning styles.

Figure 11 Students preferred learning style

**Assignments.**

The instructor offered students the option of submitting their assignments in whatever format they chose. In the fall 2014 group, there were a total of 88 opportunities to submit assignments. Forty-one percent of the assignments were submitted in an alternative format and 59% were text (Figure 12). There were a total of 144 opportunities to submit assignments for the spring 2015 group, 27% were in an alternative format and 73% were text (Figure 13).

Figure 12 Student submission of Assignments Alternative vs. text format

Figure 13 Student submission of Assignments Alternative vs. text for5mat

Students used a variety of alternative formats as indicated in Figures 14 and 15.

Figure 14 Fall 2014: Alternative formats used

Figure 16 Spring 2015: Alternative formats used

The most used alternative formats can be categorized as slide shows with PowerPoint being the most frequently used.

Figures 16 and 17 show how many assignments were submitted in alternative format by assignment. It should be noted that for some assignments either students were not asked to submit an assignment (e.g. Skype meetings or selecting partners) or the format of the assignment was prescribed. These assignment numbers are not shown because they are not applicable since students did not have a choice.

Figure 17 Fall 2014: Submission of Alternative Assignments by Assignment

Figure 18 Spring 2015: Submission of Alternative Format by Assignment

As shown in Figures 16 and 17 some assignments were submitted in an alternative format more frequently. During the fall 2014 class 50% of the assignments were submitted in an alternative format. In the spring 2015 class only two assignments (#3 and #8) stand out as being submitted in an alternative format by a substantial number of the 18 students (#8 and #15 respectively).

**Discussion**

The questionnaire data clearly show that most students in these classes preferred a video format when viewing content in order to learn content. This supports the data which indicate that most of the students describe themselves as visual learners. This does not mean that text should not be used since there were a substantial number of students who preferred and used text. In order to maximize learning, when designing a course, different learning styles should be taken into account and different formats for presenting the content should be made available.

From an instructor’s point of view there are a number of dilemmas attached to using visual or video material for teaching. It is difficult to find materials that communicate the breadth and depth of knowledge that is available in text format. It is a daunting task to find high quality engaging video presentations in a particular content area. Making one’s own videos that work well is beyond many individual instructors’ capabilities. Nevertheless, even with these limitations, many students in these classes found the video option preferable.

The Blackboard data on actual use of alternative formats for viewing assignment directions showed that both groups used PowerPoint a small percentage of the time ranging from 19% (Assignment #1) to 1% (Assignment #10) for the spring 2015 group. The fall 2014 group also used PowerPoint similarly ranging from 24% (Assignment #2) to 1% (Assignment #1) of the time. The Blackboard data is somewhat contradictory to the questionnaire data in which most students indicated that the alternative formats were very helpful and that PowerPoint was preferred as a second choice. However, the responses to the open ended questions about this reveal that a good number of students wrote that while alternative formats were not necessarily useful for the person who wrote the response, it was a good option to have available. It should be noted that most students enrolled in these graduate courses had only started taking online courses with this M.Ed. and certificate program. In addition, most if not all have not been exposed to having the option of using alternative formats previously and indicated it was more time effective to read the text assignments. Because these students have only experienced using text for assignment directions, viewing and listening to text read (PowerPoint with voiceover) may have been out of their comfort zone.

The Blackboard data showed that the use of videos for content resources was considerably higher than the use of PowerPoint but that videos were still accessed less frequently than the text. A possible explanation as to why the text was accessed more frequently is that the videos were listed in a separate folder while the text resources were listed along with the assignment directions. In such circumstances a true comparison cannot be made. However, it is interesting to note that for the spring 2015 group, Assignment #4 required that students view videos, as well as, text resources. Video viewing was not optional. In this case the videos were accessed almost twice as often as the text.

Since text resources in both courses were accessed more often than videos, it is fair to ask why 64% of the students that responded to the questionnaire indicated that they preferred the YouTube videos over the text resources and almost all reported that they were visual learners. This inconsistency may be because having gone through many years of text-based learning, graduate students are more comfortable with the text mode. A small portion ventured to use the videos. Another factor may be that often the text contains more in-depth information. Even though the videos that were selected were purposely chosen for containing parallel content that was engaging and in a relatively short presentation, students may have felt that they would lose some content by choosing videos. This may be a focus for additional research.

A screencast with an overview of the week was offered each week for both courses. In the fall 2014 course for every week except week 3 the screencast was accessed only once or not at all. One explanation is that at the end of the second week the instructor had completed the one-to-one Skype meetings during which she mentioned all the alternative formats. Students may have accessed the screencast in the third week to find out what it had to offer and then most may have decided they did not want to use them. For the first two weeks, the spring 2015 group started out accessing both the text and screencast versions of the overview. However both were accessed less frequently as the course proceeded. The screencast viewing dropped. Students may have found it more efficient to read the overview than to listen and view slides. It is unclear what the screencast option may have contributed to the overall course experience and whether they were worthwhile developing. The question that may be asked is if one or a few students access them and potentially benefit from them, should they be included as an alternative? This may be a focus for additional research.

In the questionnaire students shared that there was some relationship between the participants’ preferences about formats and the course content. One third thought that it influenced their choice of formats and two thirds did not. Comfort level with a particular format and learning styles seem to have influenced their choice. When teaching a course it is helpful to note that not all students learn the same way. The goal is hopefully to reach all students. Even though many students did not think content influenced the format, students indicated that various formats should be available.

Students were given the option to use alternative means of submitting their assignments. A substantial number of students submitted their assignments in an alternative format. Twenty seven percent of the assignments in the first class of the certificate program and 41% of all assignments in the capstone certificate class were submitted in alternative formats.

The questionnaire responses indicated that there was an almost unanimous approval of being allowed to submitted assignments in alternative formats. In addition, a larger percentage of assignments were non-text in the capstone class than the initial certificate class.

We speculate that this difference is based on a number of factors. As graduate students, many were most comfortable with submitting their assignments in a traditional text format. Although enrolled in a technology program, using a different format may have meant spending more time doing their assignments. Some students may have found it easier to do what they are familiar with due to time constraints. They, in principle, approved of this idea but may have found it difficult to select an alternative tool to use and then re-conceptualize how to approach the assignment. The most popular tools chosen were PowerPoint and Prezi which are tools that are well known. This may have helped students avoid the problem of selecting a tool. Most went with what they knew and were comfortable with.

The fact that a greater percentage of students in the capstone certificate class chose the use of alternative tools may have been due to having taken more courses and because of that, they might have been more knowledgeable and comfortable with using alternative tools at end of the certificate or M.Ed. program.

For those that chose to use alternative formats, they may have been more comfortable since it may have matched their learning style better. In addition, some students, even at the graduate level, dislike writing. Some students may appreciate doing assignments in a variety of ways and enjoy experimentation. When an interesting format was used by some students, positive comments from classmates were often posted on the discussion board. This peer approval may have influenced some to venture into use of alternative formats or continue using them.

The question still remains as to why almost all students indicated that submitting assignments in an alternative format was very helpful. The answer may be that this freedom opens up possibilities and allows students to experiment with different formats as well as challenged some students to learn new presentation tools. There were a number of instructional technology specialists in the class and often they were the students who used alternative formats the most. Another factor may have been that those who used the alternative format just found it more interesting to do this than submitting text. This may be a focus for additional research.

**Recommendations**

When teaching online courses much planning needs to occur (Cook, 2012; Sims, Dobbs, & Hand, 2002; Thormann & Zimmerman, 2012). Although textbooks about online learning and experts in the field recommend that UDL strategies should be used there is little research concerning students’ preference and use of these principles (Edyburn, 2010). This research concerning students’ format preferences may help instructors and course designers to determine whether some UDL principles should be incorporated in course development. Questionnaires, Blackboard usage and submission of assignments data lead us to recommend the following:

* Use alternative formats to present both course content and assignment directions to support different learning styles;
* Use videos and other visuals to support students since most report that they are primarily visual learners;
* Offer students the opportunity to submit assignments in an alternative formats to meet various learning styles and to challenge students;
* Use alternative formats to serve as a model for promoting better learning;
* Use the online environment as an opportunity to satisfy the different learning styles.

**Conclusion**

Although the number of participants in this study was small and not all students prefer using alternative formats, this option should be made available so that online instructors are able to reach a wide range of students. This research confirms that use of alternative formats which are components of UDL strategies have validity as perceived by students and also extends into students’ practice. Incorporation of other UDL approaches should be studied to determine the efficacy of using additional teaching techniques.

No teaching strategy or instruction works perfectly for every student. Although use of alternative formats can be time consuming and there are hurdles to overcome, instructors are able to potentially help more students attain higher levels of learning by using some if not all of the strategies addressed in this research.

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