High-School Students' Perceptions of Effective Online Course Design

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Introduction

The medium and mode of distance education have undergone a variety of advancements. Many of these advancements have been reflected in the nature of K-12 distance education in the province of Newfoundland and Labrador, Canada. Historically, in this province, K-12 distance learning was delivered through a telecommunication audiographics system known as the Tele-medicine/TETRA/ system (Barbour, 2005a). In many instances, assessments were submitted on paper using facsimile technology.

Near the end of 2000, the Centre for Distance Learning and Innovation (CDLI) was established to help modernize the delivery of K-12 distance education. By 2008, the number of course registrations had increased by 69% and courses offered had jumped 100% (Howard, 2008). Barbour (2005b; 2005c; 2007) conducted a study of effective online course design by examining the perceptions of course developers, teachers and administrators at the CDLI. The study resulted in seven recommendations for effective course design as follows:

1. prior to beginning development of any of the web-based content, plan out individual lessons and specific items to be included;
2. keep the navigation simple and to a minimum, without presenting the content the same way in every lesson;
3. provide a summary of the content from the required readings or the synchronous lesson and include examples that are personalized to the students' own context;
4. ensure students are given clear instructions and model expectations of the style and level that will be required for student work;
5. refrain from using too much text and consider the use of visuals to replace or supplement text when applicable;
6. use multimedia to enhance the content and not simply because it is available; and
7. develop content for the average or below-average student, while including enrichment activities for above-average students.

There was no follow-up to the original Barbour (2005b; 2005c; 2007) studies to determine if the course design recommendations were actually applied in practice or whether students performed better in courses that applied these recommendations. Nor were there any studies that investigated if students' perspectives were congruent with these recommendations. The purpose of the study reported on in this paper, therefore, was to examine student perceptions of effective online course design in the CDLI. This study was guided by the following research question: What are student perceptions of effective online course design? Their perceptions were identified through interviews and a focus group.

This paper begins by examining the limited research that has been conducted into online course design in K-12 online learning. This examination is followed by a description of the

methodology, and the interviews and focus groups that were conducted. The results' section is grouped into four themes of students' perceptions of effective online course design. These themes are compared with the seven recommendations identified through a study of the perceptions of teachers, and administrators.

Literature review

The use of K-12 online learning has advanced through Canada and the United States (Barbour, 2012; Watson, Murin, Vashaw, Gemin, & Rapp, 2012) and there is a growing literature based and focused on the delivery of K-12 online learning (e.g., Davis & Roblyer, 2005; DiPietro, 2010; DiPietro, Ferdig, Black, & Preston, 2008; Ferdig, Cavanaugh, DiPietro, Black, & Dawson, 2009; Lowes, 2005; Murphy & Rodríguez-Manzanares, 2009a, 2009b; Nippard & Murphy, 2007; Smith, 2009). However, there has been much less research conducted into the design of K-12 online learning (Barbour, 2013).

During the past decade, online course design was often not a primary consideration and was often copied directly from the face-to-face model of education. Many early online courses relied strictly on e-mail, chat rooms, and discussion boards (Gibson & Herrera, 1999; Perrin & Mayhew, 2000). The online courses dispensed their information using the traditional manner of speech and text, with the only difference being the fact that the delivery medium was online. Further, larger and better-funded K-12 online learning programs, such as the US-based Virtual High School Collaborative (VHS), saw the benefits of guiding teachers through course construction. One of the ways the VHS guided teachers to focus on online course design was to require all of their teachers to complete a 26-week graduate level program that includes a strong component – both theoretical and practical – in online course design (Zucker & Kozma, 2003).

In terms of research on online course design, one line of inquiry (e.g., Barbour & Cooze, 2004; Cooze & Barbour, 2005; 2007) examined the online course design through the lens of learning styles. Data from these studies indicated that visual, interpersonal, bodily-kinesthetic, logical-mathematical, visual-spatial and assimilator K-12 learners adapted most easily to online learning. This research suggested that online course designers should focus specifically on the students who did not possess these learning styles, as students who did possess these characteristics were performing well in the online environment regardless of the online course design. However, it should be noted that research into learning styles has been found to be methodologically unreliable (Coffield, Moseley, Hall & Ecclestone, 2004), so many might question the usefulness of this scholarship.

In 2007, the International Association for K-12 Online Learning (iNACOL) released their *National Standards for Quality Online Courses*. The standards were eventually updated in 2011 but the original document provided a rubric that graded courses on a four-point scale in six general areas: content, instructional design, student assessment, technology, course evaluation and management, and 21st century skills (iNACOL, 2007, 2011). Under each of these areas, iNACOL listed specific guidelines that should be followed. This rubric was adopted from an earlier set of standards released by the Southern Regional Education Board, with some additions made based on iNACOL's involvement in the Partnership for 21st Century Skills. Even though several states have adopted the iNACOL standards for the purpose of reviewing their K-12

online courses (Bridges, Smith, & Lewis, 2013), there is actually no published research to date that examines the reliability or validity of these standards.

To date, one of the few systematic research initiatives that have explored effective online course design has been the Quality Matters initiative. Originally created by MarylandOnline in the early 2000s, the Quality Matters program is a not-for-profit, subscription-based company that can now be found in 46 states. The program is designed to help guide online courses at all levels with a wide array of services (i.e., grades 6-12 and higher education). One such service is a peer-review for online courses through a research-based, validated rubric (Greenberg, 2011). The rubric includes eight general standards:

1. course overview and introduction,
2. learning objectives (competencies),
3. assessment and measurement,
4. instructional materials,
5. learner interaction and engagement,
6. course technology,
7. learner support, and
8. accessibility. (MarylandOnline, 2013)

In addition to these eight general areas, the rubric included 41 specific standards. The peer-review process begins with an initial four-to-six-week review during which feedback is provided to help the institution continually improve their course. Further, Quality Matters also provides training through workshops in using the Quality Matters' rubric, designing online courses, using appropriate media, and becoming a peer reviewer. However, what was still absent – even in the development of this reliable and valid instrument – was the student voice. This study aims to partially fill this gap.

Methodology

We asked ten principals from rural schools to identify students who were articulate and who had taken multiple courses through the CDLI. In essence, we were requesting a purposeful sample or participants who were "capable of articulating accounts, descriptions, and evaluations in many ways, from more than a single position of perspective, responding in more than one voice…" (Holstein & Gubrium, 1995, p.74). The principals identified six students who they believed met these requirements. The six participants were from four different schools. Five of the participants were grade twelve students, while one was a grade ten student. These six individuals had completed a total of fourteen CDLI courses and were six weeks away from completing another thirteen at the time of this study. All names are pseudonyms.

Data collection

The six students were divided into two groups: one group of two students with whom the lead author conducted interviews (i.e., Becky and Lori) and a group of four students who participated in a focus group (i.e., Kari, Jenni, Carla and Annette). The interviews and focus group were conducted during the spring of 2005.

The purpose of the interviews was consistent with Seidman (1998), who indicated that interviews are useful "to concentrate on concrete details of the participants' present experience in the topic area of study" (p. 12). More specifically, we were interested in their experience using the asynchronous content in the courses that they had taken with the CDLI, including what they found useful and not so useful with those course materials. We wanted them to describe their "stories about their experiences in school as a way of eliciting details" on the topic (Seidman, p. 12). The interviews were between 30 and 60 minutes in length and were conducted over the telephone using a semi-structured protocol.

We also used an online focus group along with interviews. Barbour (1999) described how focus groups are just one part of a multi-method strategy to collect data on the topic. The intention was to allow us to increase the number of students from whom we received input, but also to focus that input by using actual asynchronous content as the focus of our semi-structure focus group protocol. The focus group was conducted using *Elluminate Live*. The *Elluminate Live* allowed for two-way voice over the Internet, a shared interactive whiteboard, instant messaging, application sharing, breakout rooms, and interactive quiz and survey management. During the focus group, the two-way voice over the Internet and instant messaging were the tools primarily used along with some use of the whiteboard and the application sharing features.

The focus group consisted of four of the six students, two of whom were present at the beginning, one who joined the session after twenty minutes (she had been experiencing technical difficulties in getting into *Elluminate Live*), and the fourth student who joined the session for the final twenty minutes.

Data analysis

Both the interviews and the focus group were recorded and transcribed, using pseudonyms for the participants' names and other identifying information, incorporating any notes took during the interview or focus group into the final transcription in a different font to indicate their status as observer's notes. A second individual independently checked each transcript for accuracy. After the content of the transcript was verified as accurate, we provided the students with the opportunity to member check their transcript. We did not receive any changes or even acknowledgements that the transcript was received. We took this to mean that the transcript was either acceptable or simply not read.

We analyzed the data using an inductive analysis approach. LeCompte and Preissle (1993) described this approach as scanning the data for categories and relationships within individual transcript and between transcripts. Ezzy (2002) described the constant comparative method, the form of inductive analysis that we utilized, as developing and identifying codes that can be compared for similarities and differences. These "comparisons allow data to be group and differentiated, as categories are identified and various pieces of data are grouped together" (p. 90). Due to the lead author's personal experience with the CDLI, other virtual schools and the previous study, we were attentive to potential categories and groupings. Using this method we searched for emerging themes across interviews (Kvale, 1996) and specific statements supporting or dismissing these themes (Shank, 2002).

Results

We have grouped the results into four themes. The themes are: lack of use of asynchronous web-based content; the need for multimedia; the need for content beyond the text; the need for self-assessment tools. We discuss each one separately using verbatim quotes from students.

Participants in that study felt that the students would skip the "you will learn" and "you should know" sections of the course content altogether, and only use the other sections of the course in varying degrees. However, two of the students stated that they "hardly used" the web-based content, while one student said that she only used it "one out of five" of her offline classes. Two of the three remaining students made similar use. When they did use the asynchronous web-based content, students preferred that it deal "with the content that [they] learn" (i.e. the content of the real-time, online interactions in *ELive* with students). The students found the web-based content, "really good for studying" or when they couldn't "find the answer [or] an explanation." There was one student who simply didn't use the asynchronous web-based content at all, instead choosing to use the multimedia learning objects associated with the course.

According to the students, one of the barriers that prevented them from using the asynchronous web-based content was the type and amount of work that teachers assigned during offline time. "Teachers always have lots of questions or assignments for you to do, we're never short of work," commented one student, who recommended, "more time for students to look through the web [asynchronous web-based] material." As one student pointed out, "sometimes we do lessons like the one you have there on the board [a sample lesson from the asynchronous web-based content], but other times she [the teacher] just assigns questions from the book." Another student stated that her teacher "rarely" took assignments from the asynchronous web-based content. One student indicated that she used her "book a lot more than the web." She also noted that the course content might not "be explained as good [sic] as the book." Another added, "I'm not sure if I trust what is on the web." One student suggested that teachers should "remind students that it [online content] is there and to use it."

The students indicated that simply providing text-based lessons on the web was not useful. "Text is alright, but sometimes it's not really useful," stated one student, who wanted "more than just reading through text." Instead, students were more interested in lessons that used the various media that the Internet could offer. This media included "links…because they take you [to] other really useful sites", "videos…so you can actually see what they are doing," and "pictures and things in his own words." As one student summarized it, media like these are "really interesting and a lot better than sitting down and reading the book."

Students also wanted media based on its usefulness and not simply because the CDLI was capable of including it. Specifically, the students in this study appreciated diagrams (static and interactive) "that could actually show you and let you see how it works." They also found the multimedia learning objects that had "the information in there all done for you exactly what you have to do" useful. Overall, they wanted videos, interactives, and diagrams that provided them with "a different way of understanding concepts."

Students wanted their web-based content to provide a good set of notes. As one student stated, "you need a good set of notes to follow." She noted, "I don't even use my textbook because he [her teacher] has such a good set of notes." This statement was consistent with another student's, who said, "if there's [sic] good notes, it's easier to study." A good set of notes was explained by a student as containing "a lot of step-by-step things to explain it to you and show you how to do it." A second student added that good notes included "examples about things like that in a different kind of explanation than what your book gives you." This was one point with which all six students were in agreement.

Five of the six students also indicated that "the test yourself is really helpful." The "test yourself" feature was a java-scripted self-assessment where students were given a series of multiple-choice questions and clicked on the radio buttons to select their response. Once completed, students would click submit and the correct answers would be displayed. These assessments were not recorded by the course management system, and were strictly for student use. One student noted they enjoyed these items "because they really give you an idea of what it is going to be like for the test and they help you remember." Another student expressed a similar comment, saying the "test yourself" feature "let you know if you're on track, if you understand what the lesson's about." A third student found them "really good for studying…for a lot of people [i.e., students] they didn't know how to review."

Discussion

We compared students' perspectives with Barbour's (2005b, 2005c, 2007) seven recommendations as follows:

1. prior to beginning development of any of the web-based material, plan out the course with ideas for the individual lessons and specific items that they would like to include;

This relevance of this recommendation is highlighted in students' preference for a more careful consideration of the type of content to which they are given access. Particularly, the recommendation relates to students' preference for access to notes as well as their tendency to ignore much of the content that the course had been initially designed with.

2. keep the navigation simple and to a minimum, without presenting the content the same way in every lesson;

This recommendation pertaining to a need for variation in the content may be relevant to students' comments about not using the web content. We can hypothesize that students may have used the content more if were presented in different ways with each lesson.

3. provide a summary of the content from the required readings or the synchronous lesson and include examples that are personalized to the students' own context;

The first part of this recommendation reinforces students' comments pertaining to the preference for "good notes." However, students wanted more than merely summaries, they wanted further

explanations of content. This preference for content is supported by Anderson's (2004) finding that student-content interaction is important to success.

4. ensure students are given clear instructions and model expectations of the style and level that will be required for student work;
7. develop content for the average or below-average student, while including enrichment activities for above-average students.

There was no congruence between recommendations 4 and 7 and any of the results of this study. Students' comments referenced more so the consumption of knowledge. They did not refer to any styles or levels of student work. Students did not reference having access to content differentiated by student level. They did, however, refer to the need for content that was in different formats or that explained things in different ways.

5. refrain from using too much text and consider the use of visuals to replace or supplement text when applicable;
6. use multimedia to enhance the content and not simply because it is available;

We can consider the above two recommendations together. Both are congruent with students' comments. The students indicated that text was not useful. Students wanted links, videos and pictures. They wanted something beyond an experience of reading and they wanted to be able to visualize the phenomena being studied, and see how it worked. This preference for multimedia was not only to make learning more interesting but to make content more comprehensible by explaining content in different formats. Although, as Fox (2010) claimed, multimedia by itself does not yield better results than text, with careful integration and affective pedagogy, integration of multimedia may better support students' preferences for learning online.

Although most of students' comments were referenced in the recommendations, one category of comments (i.e., regarding self-assessment tools) was not. Students appreciated having tools that they could use to check their understanding, keep them on track and reinforce their learning. The addition of such tools to online course design may represent a recommendation that could be added to the seven already proposed. The addition of such a tool would also be consistent with Hatziapostolou et al.'s (2010) argument that stresses the significance of an online feedback tool that is timely and associates with the assessment

Conclusions

The purpose of the study reported on in this paper was to examine student perceptions of effective online course design in the CDLI. Analysis of interviews and focus groups with six CDLI students resulted in the identification of four categories of perceptions of the course design. These categories pointed to a lack of use of asynchronous web-based content; the need for multimedia; the need for content beyond the text and the need for self-assessment tools. We compared these four categories of students' perceptions with seven recommendations for designing online courses identified through a study of the perceptions of teachers, and administrators by Barbour (2005b; 2005c; 2007). There was no congruence between

recommendations 4 and 7 and any of the results of this study. All other recommendations were supported by students' perceptions.

The student perceptions provide some insights for online course design including more careful consideration of the type of content to which students are given access; provision of notes that explain content; the need for content in different formats and that explains concepts in different ways, incorporation of links, videos and pictures. Although most of students' comments were referenced in the recommendations, one category of comments (i.e., regarding self-assessment tools) was not. Students appreciated having tools that they could use to check their understanding, keep them on track and reinforce their learning. The addition of such tools to online course design may represent a recommendation that could be added to the seven already proposed.

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