

Blended Learning in the Visual Communications Classroom: Student Reflections on a Multimedia Course

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Abstract: Advances in digital technology and a rapidly evolving media landscape continue to dramatically change teaching and learning. Among these changes is the emergence of multimedia teaching and learning tools, online degree programs, and hybrid classes that blend traditional and digital content delivery. At the same time, visual communication programs that are traditionally print-centric have had to make room for Web design and multimedia storytelling courses, as well as technical skills development. To add parsimony to these two areas of study, we chronicle how a blended model has been introduced in a required, 100-level visual communication course through a longitudinal study that followed 174 students through two versions of the same course, one that used blended learning strategies and one that participated in a more traditional method of course delivery. In combining an analysis of statements made by the participants in weekly journals (n=13,552) and the data gathered through a survey (n=174), we compared reactions between the two groups. Additionally, qualitative data from the journals was used to fully explicate the reactions students had to the course. This study sheds light on the effectiveness of a blended model in the context of students' enjoyment, engagement, and perceived learning outcomes. The results revealed that the blended model was in no way different from the traditional course in terms of engagement and attachment. Journal data revealed students in the blended sections were significantly less negative about the course material, personal achievement, technology, and their emotional reactions than their traditional counterparts. Additionally, statements made by students regarding the issue of fear of the course and problems regarding technology substantially faded over the 15-week semester. Our overall findings indicate that students are able to adapt well to the technology and processes that make blended learning different from traditional classroom learning. Implications for pedagogy and future research are discussed.

Keywords: blended learning, visual communication, multimedia teaching and learning

1. Introduction

"Someday, in the distant future, our grandchildren's grandchildren will develop a new equivalent of our classrooms. They will spend many hours in front of boxes with fires glowing within. May they have the wisdom to know the difference between light and knowledge." – Plato

The depth of Plato's 2,000-year-old insight is profound if not incredibly eerie. Indeed, advances in digital technology and a rapidly evolving media landscape consistently change the ways we approach teaching and learning. Among these changes is the emergence of multimedia as a pedagogical concept, online degree programs, and hybrid courses that blend traditional methods with new technology. As educators attempt to combine new methods with widely available technologies, an opportunity arises to study blended course models.

At the same time, visual communication curricula are bursting at the seams. Programs that were once predominantly print-centric have also had to make room for Web design and multimedia courses, as well as more software training and other technical skills development. Likewise, the potential for animation and interactivity brought about by digital media constantly changes design. To make matters more complex, none of these "new" approaches replaces the old. Rather, we strive to maintain the integrity of our foundations in print while adding courses in new media.

This research was predicated on the notion that a blended learning model might provide visual communication educators with an effective method for addressing some of the concerns noted above. To test this notion, a blended model was developed for a required, 100-level visual communication course for journalism and broadcast news students at a Midwest university. Subsequently, a longitudinal study followed 174 students through two different iterations of the course, one blended and one traditional. Although the complete research measures the blended course's effectiveness from a number of different perspectives including, how different types of learners (visual, verbal, and

kinesthetic) responded to the blended model and how learning outcomes were affected by both versions of the course, in the interests of focus and length, this paper directly addresses students' enjoyment of and engagement with the course, as well as their perceptions of the learning experience.

2. Literature review

Research on blended learning has noted many positive results. Studies have found that adult learners prefer blended course designs because they offer opportunities for personalization, self-direction, variety, and learning communities (Ausburn, 2004) and that student engagement and satisfaction in a blended course was higher than in previous, traditional versions of the same course (Cooner, 2005).

Many universities have begun to offer courses with some degree of digital learning for a number of important reasons. First, online technologies offer a consumer-centric approach to delivery (Larkin & Belson, 2005) that gives students greater control over the learning experience. Second, digital learning and online technologies can create highly simulative and rich interactive experiences for students. Third, online dissemination can broaden and increase student audiences (Fearing & Riley, 2005). As educators, researchers and policymakers press for updated learning models to migrate from a 1950s approach to education, electronic learning is gaining support as one viable way to meet the needs of a changing and complex world (McCombs & Vakili, 2005).

An increasing number of educators are also experimenting with "innovative technology-mediated" approaches to teaching, dramatically changing the ways students interact with course content (West & Graham, 2005). This relatively common adoption of digital learning technologies has increased the integration of multimedia teaching and learning tools into the traditional, face-to-face classroom setting (Bonk, Graham, Cross & Moore; 2005). This "blended" or "hybrid" (Young, 2002) approach to content delivery has experienced widespread growth in secondary and higher education. In 2003, the American Society for Training and Development listed blended learning among the top ten trends to emerge in education (Rooney, 2003).

By 2004, 2,000 of the 6,000 courses offered by Brigham Young University were using Blackboard as the primary delivery platform for online content (Graham & Robinson, 2005). Graham and Robinson discovered that although the prevalence of blended learning was increasing at breakneck speed on BYU's campus, most blended environments were enhancing pedagogy as opposed to transforming the ways teaching and learning occur. "For there to be greater adoption of transforming blends among faculty, we believe that there needs to be a greater focus on developing cases and models that can help faculty to see what the possibilities are and how to achieve those possibilities within the resource constraints of their institutions" (Graham & Robinson, 2005: 108).

Other noteworthy studies related to pedagogical issues associated with blended learning have shown that blended learning increases active learning strategies among students (Collis, Bruijstens, & van der Veen, 2003). Likewise Danchak and Huguet (2004: 209), assert that the process of "choosing what to present is as important as how it is presented." They add, "Since students learn in different ways, we must provide multiple learning activities from which the learner can choose."

A number of studies have targeted specific blended learning strategies to examine their individual strengths and weaknesses. Heinze and Procter (2006) found that discussion boards present an equal number of challenges (too much communication, frequency of off-topic discussions, and general lack of initiation of communication) as benefits (study help, increased social interaction, and the development of a student community). Peer-to-peer learning strategies (Hartman, Dziuban, & Moskal, 1999), as well as learner-centered strategies (Morgan, 2002; Smelser, 2002) have also been primary areas of interest. Some researchers are even experimenting with short message service (SMS) technologies as a way to integrate text messaging and mobile phone use as a blended learning strategy (Randall, Seet, Lim, & Elangovan 2006).

Several studies have also been conducted to explore learning outcomes as they relate to different blended methods. Hughes (2007) asserts that blending online learning with targeted classroom sessions can improve retention and identify "at risk" learners, particularly in largely online programs. Garrison and Kanuka (2004: 97) assert, "the real test of blended learning is the effective integration of the two main components (face-to-face and Internet technology) such that we are not just adding on to the existing dominant approach or method."

Osguthorpe and Graham (2003) identify a number of strengths and weakness of traditional face-to-face instruction and predominantly online course models. They note that in addition to the general absence of time flexibility, traditional models often fall short of addressing the many learning styles represented by the students in the room. On the other hand, online courses often create isolated learning environments for students, which can reduce individual motivation. However, in spite of the push and pull of benefits and challenges associated with each discreet method, “the important consideration is to ensure that the blend involves the strengths of each type of learning environment and none of the weaknesses” (Osguthorpe & Graham, 2003: 228).

In 2001 the U.S. Department of Education reported 83 percent of university instructors used the traditional lecture as a primary teaching method, yet many are beginning to experiment with multimedia tools. Duke and Purdue, for example, offer hundreds of podcast courses, allowing students to download lectures to MP3 players. Scholars at these institutions have argued this allows students to combat boredom, learn at their own pace, and go back through troubling portions of a lecture (Andreatta, 2006). And ultimately, the biggest proponents of blended learning predict future models for teaching and learning will be defined not by whether they blend, but how they blend (Bonk, Graham, Cross, & Moore, 2005).

3. Study rationale

A blended curriculum can take many forms, especially when professors are certain all students have equal and adequate access to the Internet and other necessary applications. Thus, our study represents only one unique model. However, data collected over two semesters (2007-2008) for a total of 174 student subjects provides both a comparative analysis between traditional and blended approaches to the same course, as well as a longitudinal reflection of the learning process that includes how students adapted to a blended course during a 16-week semester.

Three main goals prompted this longitudinal study: 1) compare learning outcomes between a blended approach and a traditional course plan; 2) examine issues of engagement, attachment, and enjoyment for students enrolled in both versions of the course; and 3) analyze the effectiveness and efficiency of a variety of multimedia tools as primary course content. It was *not* our intention to replace student-instructor interaction with virtual tools and online courseware. Rather, by experimenting with blended approaches, we seek ways to provide students with a broader range of course content in an equally broad range of formats.

4. Method

This study includes two subject sets and two data sources. The data was cleaned using mean substitution to replace missing data points. No more than 5 percent of any one variable or any one case was replaced in this manner. Any case missing more than 5 percent of its data was removed. After completing this task, 171 usable cases remained for analysis. Due to our greater interest in the outcome of the blended learning students, the sample was purposely imbalanced, giving us 117 participants in a blended approach to the course that combined face-to-face meetings between students and instructors with multimedia tools, such as an electronic textbook, video lectures, podcasts, online discussion boards, and digital handouts. Fifty-four students participated in a separate version of the course based on traditional visual communication pedagogy (i.e., in-class, instructor-led lectures, a printed textbook, and projects).

The first data source was comprised of weekly journals kept by students intended to gauge their feelings about progress in the course and respective learning methods. Journals produced a total of 13,552 statements that were coded based on a number of qualitative categories to provide researchers with a method for spotting trends in student attitudes about the course and its content. The second data source was a survey administered to students at the end of the semester focused on the complete course experience. Questions addressed students' overall feelings about what they learned and the effectiveness of the learning methods in their respective courses.

This combination of methods allowed us to more fully assess both the overall feelings about the course and students' up-to-the-minute reactions during the process. Of course, enjoyment is affected by many factors, including students' comfort levels with the material and/or technology, perceptions of the quality of course administration, affinity for the subject matter, and personal motivation. To that

end, we gathered additional demographic data to better hone our focus on the benefits and drawbacks associated with blended learning in this course.

4.1 Course design

Both the traditional and blended versions of the course were structured according to five course units: basic design principles, Gestalt Theory, typography, color theory, and layout techniques. In the traditional course, students met twice a week for an hour and 50 minutes in a face-to-face classroom environment. Students were given regular reading assignments from a printed textbook, attended instructor-led lectures on each unit, and were provided with lab time to work on design projects that corresponded to each unit. Students were tested over their knowledge of the topics listed above and engaged in design critiques in class. Students were given 20 minutes each week to complete a journal entry.

In the blended version of the course, students also met twice a week for an hour and 50 minutes in a face-to-face classroom environment. And they were given regular reading assignments. However, they had the choice of using a printed textbook or a non-linear, interactive e-book. Instead of instructor-led lectures, they were offered both video and audio lectures. In class, students had time to work on projects and get one-on-one feedback from instructors, and the instructors engaged students in brief discussions over course topics and critiques of their work. Students were tested over their knowledge of the course topics and given 20 minutes each week to complete a journal entry. Online discussion boards were employed and students were prompted to answer specific, unit-related questions. The multimedia tools were accessed via an online Blackboard site.

5. Coded journal entry results

Journal entries yielded 13,552 statements for analysis, 7,548 in the blended sections and 6,004 in the non-blended sections. Two individuals coded data resulting in a Cohen's Kappa of .88, making this a reliable set of codes.

We examined all of the statements over time and then studied various sub-groupings of the data. The data gathered from statements over time reveals a predominantly consistent and even pattern. The most entries accounted for in any one week is 9 percent of the data (1,221 statements in week 4) and the least is 4.1 percent (561 in week 15). We noted a precipitous drop between weeks 7 and 8 (1,108 to 873), with the data never reaching four figures per week again after that point. The data patterns do not differ between the two groups.

In assessing the key item groupings of interest, we found that the greatest statements were made in the expectations categories (4,563 total attributions). While 1,147 statements noted that the participant felt he or she had learned something, an additional 804 statements made suggestions for ways to improve the course. The remaining 2,612 attributions were coded positive, neutral, or negative statements about the expectations of the coursework (See Appendix A for the complete coding scheme).

To better assess the changes over time, we conducted a Chi-square analysis, which paired the three expectation variables with the time frame in which they were stated. As Chi squares require a minimum expected value of five cases per cell, and since the number of negative statements was low enough that we ran the risk of not meeting this parameter, we collapsed the time element into thirds (five weeks for three segments of a 15-week course). This allowed for equal distribution of the time element while giving us the best chance of meeting the needs of the statistic.

The Chi Square was significant ($\chi^2=43.03$, $p < .001$) and several cells made strong contributions to this statistic. However, the data ran counter to our initial theory that students would be initially negative but eventually warm up to the expectations of the class. The cell that contributed most to the Chi Square was the negative expectations cell in the third time period (standardized residual= 4.5) with the other negative cells also contributing heavily as well (first time period standardized residual= -2.2, second period= -2.8). No other cell reached the 2 barrier in either the positive or negative direction. This demonstrates that overall, students were less negative in the earlier stages of the class, only becoming negative near the end. That said, the total number of positive statements was more than five times larger than the total number of negative statements, which likely accounted for the large residual swing in the last time period.

A split of the data revealed that both the students in the blended and non-blended sections both fit the pattern outlined above in terms of significance and data spread (blended $X^2= 22.66$, $p < .001$; non-blended $X^2= 33.74$, $p < .001$). What was of greater interest was a comparative analysis of the two groups based on the positive, negative, and neutral statements made. A Chi-square analysis revealed significant differences between the groups ($X^2= 6.47$, $p < .05$) with the primary cells that contributed to the differences being in the negative expectations. The blended group had significantly fewer negative expectations than predicted by the statistical analysis (standardized residual= -1.7; 67 observed vs. 82 expected) while the non-blended students made more negative statements regarding their expectations of the course work (standardized residual= 1.6; 102 observed, 87 expected).

The statements participants made regarding their emotional states also accounted for a high percentage of our overall total (2,387 statements or 17.6 percent). Again, to better assess these statements, we collapsed the time period into the three segments and recoded the statements into three key categories: positive, negative, or neutral.

The Chi Square was again significant ($X^2= 29.47$, $p < .001$) with several cells contributing to the statistic. In the first one-third of the course, students provided significantly more positive emotional statements than in the last third (first time period standardized residual= 2.3, last time period= -3.1). In terms of the negative emotional statements, the opposite was true (first time period = -2.3, last time period = 3.1). The neutral emotional statements remained as expected throughout the process. In comparing the two groups, both Chi-squares were still significant (blended $X^2= 19.88$, $p < .01$; non-blended $X^2= 12.80$, $p < .05$). However, the blended students expressed fewer negative emotions than expected in the first block (standardized residual= -2.3), while the non-blended students were closer to the expected count (standardized residual= -0.9). The blended students also expressed more positive emotional statements than expected (standardized residual= 2.2), while the non-blended students were closer to the expected count (standardized residual= 0.6).

We again compared the groups using a Chi-square analysis and found some interesting results. The statistic was significant ($X^2= 91.50$, $p < .001$) and multiple cells contributed heavily to this outcome. The blended students were significantly less negative in their emotional statements (standardized residual= -4.3), while they expressed a higher number of positive statements than expected (standardized residual= 5.0). The inverse was true for the non-blended students (standardized residual for negative emotions= 4.3; positive emotions= -5.0).

In terms of satisfaction with their performance in the class and the performance of the instructor, we found that in both cases, participants were primarily positive. The Chi-Square on personal performance was significant ($X^2= 23.14$, $p < .001$) with a pattern of data more consistent with what we had initially expected. Participants were initially more dissatisfied with their performance than the statistic would have predicted (first time period standardized residual= 2.3) but eventually that faded (third time period standardized residual= -3.2). Additionally, the number of positive statements they made about their performance also shifted in this direction (first period standardized residual= -1.6, third time period standardized residual= 2.2). In splitting the data, we found that the Chi-square for the non-blended students was not significant ($p > .2$) while it was predictive for the blended students ($X^2= 30.30$, $p < .001$), with the residual pattern following the pattern outlined above. The Chi-square analysis between the two groups was significant ($X^2= 3.89$, $p < .05$), with blended students making fewer statements regarding dissatisfaction with their personal performance, while non-blended students made significantly more statements of that type (standardized residuals= -1.2 and 1.1, respectively).

Regarding their instructors ($X^2= 16.20$, $p < .001$), the positive statements far outnumbered the negative (184 to 28) with a general ebbing of negative statements over time. Interestingly, the number of positive statements was highest in the first one-third, indicating that any problems the participants were having with the course was not laid at the feet of the instructor. Given the small number of data points in each cell, we decided not to split the data, but did conduct a blended/non-blended comparison and found the results to be significant ($X^2= 10.70$, $p < .01$). In this case, the non-blended students expressed more statements of dissatisfaction than would be expected (standardized residual= 2.3) while the blended students expressed fewer than expected (standardized residual= -2.0).

Last, we examined the participants' statements regarding the technology. Although these students interact with technology on a daily basis, we felt this area might be among the most important to assess. We found that in the categories of technological anxieties, technological tension easement, and technological confidence, all three saw a sharp drop after either the third or fourth week. Participants showed a strong demarcation between those who highly feared the technology and were anxious about what it might do to their ability to succeed in this new course format and those who felt confident in their ability to do well. In assessing these variables, we found that after the students became acclimated to the course and the new approach to the material, they appeared to make little mention of their concerns with the technology. In the final 12 weeks of the course, no single week saw more than 16 statements regarding any one of these variables.

In terms of statements regarding the technology itself, the statements in the "technology good" category outweighed those in the "technology bad" category almost fivefold (87 to 16). In the final four weeks of the semester, only one statement was made noting any confusion with the technology, and overall, confusion seemed to be of little concern (total "technology is confusing" statements= 57). In addition, only 20 statements noted any difficulty with the videocasts and only four noted any problems with the electronic text (a total of 128 additional statements were categorized as having some technological problem; some of them revolved around issues with the students' own computers and thus were outside of the purview of this study). Comparing the two groups, we found only two interesting differences. In terms of technology anxiety, the blended students made a fewer-than-expected negative statements (standardized residual= -1.9) while the non-blended students were higher than expected (standardized residual= 2.2). In addition, the blended students were more positive about the technology in the course (standardized residual= 2.3) when compared to the non-blended students (standardized residual= -2.7).

Likewise, students offered a number of comments in journals both about the quality of individual learning tools, as well as how to improve the course. In the survey material, students gave generally positive marks to the video lecture (M= 4.83), the handouts (M= 5.05) and the electronic textbook (M= 5.08). However, they also didn't discount the value of more traditional approaches, stating some preference toward having more traditional lectures (M= 4.22) but not necessarily a traditional textbook (M= 3.67).

In regard to the video lectures, the comments were split, with 54 statements noting positive aspects of this tool while 49 noted a negative stance on it. In regard to the e-text, there were 182 positive statements on this, more than three times the number of negative responses (59). In terms of the podcasts, the responses were overwhelmingly positive (44 to 1) and the same could be said for the BlackBoard site (49 to 11) and the PowerPoint presentations (30 to 2). Students were more negative about the use of the discussion boards (19 positive and 25 negative), thus confirming to some extent earlier research on this topic.

Anecdotally, students often commented that video lectures were too static and the lecturer's voice was "boring" and "not lively enough." And although the e-book was generally well received by students, some noted that because it was in electronic form, it was more difficult to navigate back to sections that deserved more intense study. Many students in the blended sections also noted that they appreciated both the amount of "hands-on" design experience and personal attention from the professor. One student wrote, "I like that we use the course materials to learn the basics of design...and then the professor spends class time helping us with real class work instead of standing up there and lecturing at us. I learn better that way." Albeit, this is proof only that this student *thought* he/she was learning more in the blended format. However, in a course that combines so much practice and theory, perceptions of learning and rote knowledge gain are equal parts of the pedagogical equation.

6. Survey results

We first examined the outcomes of the survey data, which was collected at the end of the course. The purpose was to assess to what degree, if any, the students in the blended condition differed from those students in the non-blended condition.

Overall, the students in both conditions reported a high level of technological acumen (Blended M = 5.29, Non-blended M = 5.14) and a strong interest in using digital tools to learn (Blended M = 5.59, Non-blended M = 5.54). Additionally, the participants all reported high levels of enjoyment when it

came to the class (Blended M= 5.51, Non-blended M=5.21) while still feeling they gained competence in the subject matter (Blended M = 4.93, Non-blended M=5.11).

As for the effort, both groups reported feeling that they put forth a high level of effort in the class (Blended M= 5.86, Non-blended M= 4.48). The participants reported above average ratings regarding the number of options they had in how they learned (Blended M= 4.61, Non-blended M=4.62). They also reported below average ratings in regard to the amount of pressure they felt as a result of this course (Blended M= 3.63, Non-blended M=3.41).

A series of analyses of variances (ANOVAs) demonstrated no significant differences between these two groups on any of these variables, save one. The participants in the blended condition reported significantly higher ratings than those in the non-blended condition when it came to the effort variable. ($F= 4.98$, $p < .05$). Additionally, it's worth noting a marginally significant finding on the enjoyment variable ($F= 2.58$, $p = .1$), with those in the blended condition reporting higher scores than the non-blended participants.

7. Discussion

Legendary Ohio State University football coach Woody Hayes was fond of noting that he hated the forward pass because when you attempted one, "three things can happen and two of them are bad." This came to mind during the creation of our study because we viewed our work here as being the antithesis of Hayes' view on the pass: three things could happen and two of them would be good. In comparison, blended students could show significantly higher levels of approval than their traditional counterparts, there could be no significant differences between the groups, or the blended learning students could be significantly worse off for their experience. Only in that third condition would we have viewed our outcomes as failure.

Although much of the survey data revealed little difference between the two groups, the analysis of the journal entries provided greater insight as to how the students approached this class. In most cases, the students in the blended courses were less negative in their reactions to the course, the work, their own performance and the instructor's approach to the course. Furthermore, they were less negatively emotional regarding the course. In many cases, they demonstrated significantly more positive attitudes about what was occurring in the class, in spite of the massive changes they were required to adjust to as part of this study. To that end, the intercession of our study into their scholastic environment not only failed to create negative thoughts and consequences for them but in fact inspired them to view their learning experience in a better overall light.

These outcomes bode well for future research on blended learning for a number of reasons. First, the data demonstrates that there are differences between an end-of-semester evaluation and an ongoing assessment of real-time situational data. While students at the end of a course might synthesize their overall impressions of the course into a bland assessment, the immediate reaction to a failed project or a technological breakthrough can lead to a more thorough measure of their experiences in a course. Second, in reviewing their journal entries, we were able to parse specific aspects of their positive and negative reactions to the course. This would allow us to provide some valuable feedback to the instructors and aid future scholars in the field of blended learning. This micro-level approach has yielded valuable responses regarding the basics of the course (material, technology) and visceral responses (fear, satisfaction, personal achievement).

It's also obvious from the journal responses that one future research effort would be to modify the multimedia teaching and learning tools, making "improvements" as seen fit, and repeat the study. Students' criticism of the effectiveness of the video lectures and electronic text alone would suggest that positive feedback would increase as the teaching and learning tools improve. It's also already been noted that limiting the number of professors in the course might also eliminate variables that may have affected this study. One additional option would be to add a measure for practical knowledge gain or skills improvement for a more holistic view of how blended learning can be implemented in a visual communication course. In fact, one might argue that a scenario in which a student dramatically improves his design skills and creates work that is obviously reflective of that improvement but doesn't improve his ability to recite the seven basic design principles for a test would be a positive outcome and possibly evidence of the merits of blended models. It's the difference between knowing blue and orange are complimentary colors and being able to apply that aesthetic in creative work. And ultimately, striking a balance between students' knowledge of the concepts and ability to apply them is, after all, the ultimate goal.

In any case, we noted several patterns that were not incongruent with traditional learning. Initially, students were either excited or fearful of what they would see in the course. Technology was initially a concern but eventually became less so than other components of the course. In the end, the students felt they learned something and believed they could continue on their path toward a degree without having been hampered by the blended learning or traditional models. Perhaps the greatest outcome for us was the sense of normalcy that became part of the journals over time. Students simply viewed the blended approach as “part of the process” and to that end were able to adapt well to this environment.

This study is one of three we have constructed to measure various aspects of blended learning and how it compares to a more traditional model, so as for suggestions for future research, we would likely only be feathering our own nest. Still, we have collected data regarding specific educational outcomes that will be part of our future work as well as information regarding various learning styles and various learning tools. We hope to assess whether one model or the other is more likely to yield improved learning and to see whether learning styles lead to the utilization of specific digital tools. We believe these three studies will work in tandem to provide a well-rounded view of how blended learning effects students and their learning experiences.

8. Appendix A: coding scheme

Expectations

- 1 Neutral interpretation of course expectations (Statement has no quantitative value.)
- 2 Negative interpretation, unrealized expectation (Related to coursework selections)
- 3 Positive interpretation, desire met (Related to assignment, course content)
- 4 Negative interpretation, unrealized expectation (Emotional)
- 5 Positive impact, realized, exceeded expectations (Emotional)

Course content

- 6 Anxiety about course
- 7 Excitement about course
- 8 Eased tension about course
- 9 Confusion about course/content
- 10 Indifference about course/ content
- 11 Confidence about course/content/skills
- 12 Uncertainty about course/content
- 13 Prepared for quiz
- 14 Not prepared for quiz
- 15 Anxious about quiz
- 16 Optimistic about future/expect to do better

Technology

- 17 Anxiety
- 18 Eased tension
- 19 Confidence
- 20 Technical difficulties (video)
- 21 Technical difficulties (e-book)
- 22 Confusion with tech
- 23 Tech is helpful
- 24 Tech is not helpful
- 25 General technological problem

Performance

- 26 Dissatisfaction, personal performance
- 27 Satisfaction, personal performance
- 28 Dissatisfaction, instructor performance
- 29 Satisfaction instructor performance
- 30 Uncertain of performance
- 31 Desire to achieve (change effort, performance)
- 32 Positive opinion of freedom, creativity

Opinions of teaching tools

- 33, 34 Positive, negative video
- 35, 36 Positive, negative e-book
- 37, 38 Positive, negative podcasts
- 39, 40 Positive, negative handouts
- 41, 42 Positive, negative quiz
- 43, 44 Positive, negative discussion/lecture
- 45, 46 Positive, negative Blackboard
- 47, 48 Positive, negative Powerpoint

Misc.

- 49 Irrelevant to study
- 50 Used modules to study
- 51 Liked personal attention/interaction/students or teacher

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