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Editorial

To Improve Learning

Donald G. Perrin

When you build a house, a bridge or a high-rise, you employ an architect to determine its purpose, functions, scope and cost. The architect plans, designs and oversees the project. Blueprints specify details for each aspect of construction. A blueprint becomes the basis for preparing contracts, scheduling and supervising workers, managing cost and evaluating results.

Architecture involves both art and science. An architect can create living and working spaces that are esthetically pleasing, comfortable to occupy, and productive in achieving their desired purpose. Architects also need to explore the future and plan for flexibility so buildings can be modified to meet changing needs.

In education, we build a curriculum. A learning architect coordinates specification of its purpose, functions, scope and cost. A learning architect coordinates design and construction. The curriculum is a blueprint for course design, development, production, implementation and evaluation. A syllabus specifies the goals, content-outline, resources, outcomes and schedule of activities for each course of study. Rubrics describes how learning will be evaluated.

The challenge for a learning architect is to create learning spaces, activities and experiences that engage and motivate learners to be productive in achieving their specified objectives. Curriculum should meet current needs and be informed of probable futures in this dynamically changing society. It should be a flexible interface to social, cultural, economic, political, scientific and environmental changes.

Curriculum

Curriculum is more than content – it is a process to develop knowledge, skills, and aptitudes through many levels described in the Bloom Taxonomies. It is navigated by specific objectives that define observable changes in behavior, level of proficiency and conditions under which it is to be measured. It may suggest alternative learning environments, pedagogy and activities including reading, viewing, listening, building modelsassignments, research papers, tests, portfolios, projects, individual and team activities, discussions, participation and contribution to class.

Learning environments include individual and group activities in classrooms, laboratories, libraries and community. Learning is enriched with audiovisual, Internet, simulations, interactive multimedia, and real-world experiences.. Learning can be delivered or managed by a teacher, self-directed by the learner, or integrated into a learning management system.

Syllabus

The syllabus is a set of guidelines for the teacher and student. It defines course goals and standards, content, schedule, resources, pedagogy, evaluation and rubrics.

Resources include teaching and learning materials (textbook, web resources, audiovisuals and interactive multimedia, simulations) and services (advisors, counselors, tutors, and support for students with special needs (foreign language, writing, disabilities, health services, etc.).

Pedagogy differs for face-to-face, distance learning, and hybrid classes. It may involve excursions and field activities, apprenticeships, teaching assistant and/or special studies and projects. Institutions, teaching departments and instructors add their own flavor and emphasis based on their philosophy and experience with teaching and learning.

Distance learning invariably requires technology support such as internet, videos, and learning management systems to deliver resources, manage learning and evaluation, and provide feedback.

Rubrics show how learning will be evaluated and scored for specific activities and performance objectives. This includes assignments, projects, research papers, tests, portfolios, participation and contribution to class activities. Rubrics put instructor and students on the same page. If a learning management system is used, such as Blackboard, students can submit materials for correction 24/7. Usually this is completed in one or two days so the learner can manage his or her own learning.

Criteria for learning

Grading on a curve does not provide an absolute measure of learning. Criterion learning sets a bar to indicate when expert level is reached. This requires flexibility so learning can continue until it reaches the criterion level. In a traditional class, this leads to a spread of topics and levels that complicates correction and management by the instructor. With a learning management system (LMS) and two computer monitors, student assignments can be viewed in the order received or arranged according to the schedule of classes. The second monitor displays the answer sheet (or a list of criteria for grading creative projects). Add your grade and comments, and one key stroke adds the result to the grade record and makes it available to the student.

Give the students other incentives and flexibility – no penalty for late homework – correct errors and resubmit for full grade (or do an alternative homework exercise. Here are a few notes from my syllabus:

Follow the Rubric

The rubric for this course is designed to measure stages of learning. The goal is to get all students to the "Above Average" category on assignments, projects, tests, final PowerPoint and research paper. If you are a genius, you might be able to complete 90% of the work and get an A. However, with the support provided, and by correcting errors as you go, most students who are willing to work hard can expect a final grade of A. Set for yourself a course criterion of 900 to 1,000 possible points. Correct errors and finish incomplete work as you go forward. Collaborate with fellow students, seek instructor assistance, ask for more time when needed. Unless you have overload or disaster in your life, you have a good chance of making an A in this course if you keep up the pace and complete all of the homework; the majority of students finish with an A.

FLEXIBILITY TO FACILITATE SUCCESS:

1. ***Manage your own schedule***.
   Self-directed students are most successful because their complex lives are less constrained by traditional schedules and demands. You will not be punished for late submission of homework; you are allowed up to two additional weeks without penalty. However, bi-weekly tests must be completed by the end of the week they are assigned.

2. ***First attempt is not the final grade***.
   Learners continually find themselves in unfamiliar contexts that make learning difficult. Don't waste valuable time - call for help. The sooner the difficulty is resolved, the faster learning can resume. Call my mobile 24/7: 805-300-8080. Often the problem can be solved in a few minutes.

3. ***Eliminate the threat (or consequence) of a bad grade.***
   Threat adds pressure to prevent doing your best work. You will *not be punished* for late homework, you can *see your grade* and the answer sheet as soon as the work is corrected, you can fix mistakes to improve your grade, and you can get assistance if needed. The step-by-step description of how you solved the problem is the most important part of a correct answer.

4. ***Errors are part of learning.***
   When you know what you did wrong, what you misinterpreted, what you did not understand, you are given a chance to redo the assignment, project or test. You may be asked to do additional examples if the instructor feels it is necessary. You can also team with other students or ask the instructor for assistance or tutoring.

5. ***Subject matter? You can make some choices.***
   Not all subject matter is relevant for all students. In the real world your skills will complement those of *team* members. There are 12 modules in this course. Choose 10, or do more and count the top ten scores. Discuss your choices with the instructor. You don't have to make this choice up front. Choose alternatives *after* you get your feet wet!

6. ***Use technology to facilitate communication*.**
   For the student: Homework can be submitted in Blackboard 24/7. Work offline and attach your answers as Word or Excel files along with files from your calculation software. Grading usually takes 1-2 days. Fix and resubmit. If you need help, phone, internet, instructor, classmates and social media can provide assistance.

   For the instructor: Blackboard is an efficient interface. All homework submissions – assignments, projects, tests, PowerPoints and final papers are in a single repository in the order received. The instructor uses two computer screens - answer sheet on the left - student submission on the right. If the Blackboard display is not adequate, he can view the original file. Excel allows formulas to be displayed to help diagnose errors. The instructor adds comments, answer sheet and grades which, with one key-stroke, are sent to the student and added to gradebook. The student has instant access while the instructor advances to the next homework.

7. **If you are fearful of math** . . .
   This course would be impossible without a computer. Much of the content is not in regular math textbooks. You will learn *linear programming* to maximize profit or minimize costs; *PERT* to manage schedules, time and cost; *spreadsheets, mathematical models* and *simulations* to test ideas and optimize business outcomes; *decision analysis* to navigate high risk situations with multiple options; and forecasting to determine how to most effectively allocate your resources. Computers, software and templates will assist you to accomplish many of these tasks quickly and in a highly professional manner. However, you do have to learn how to prepare flow charts, spreadsheets, and linear programs.

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Editor' Note: Retention of distance learning students is a concern for educational institutions and their stakeholders – funding agencies, students and their families, and future employers. Some improvement is possible through pedagogy, instructional design and technical support, but educational systems built like assembly lines have few options for those who fail. Take the course again? Take it with another instructor? Proactive approaches to avoid failure include learning services such as counseling and tutoring, but this kind of support is not available for many educational programs. This is a study of students given another option, to retake a final exam.

A failed final exam, now what?
Exploring the demographics and activities of university students who retake a failed final exam in an online course

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Abstract

This quantitative study explored the demographics and activities of university students who retook a failed final exam in an online course. Exam retake and grading literature was reviewed and a summary of general principles is presented in this study. Findings from this study are accessible through frequency tables, chi-square independence probabilities for demographic groupings with variables, a paired samples t-test for comparing total hours studied by exam attempt, and Wilcoxon signed-rank tests for comparing variable across the failed and retake exam attempts. Remarkable findings are compared to findings in the body of literature.

Keywords: exam retake, failure, study habits, grading, pedagogy, student demographics, student activities, university, online, distance education, instruction, tutor, anxious, test taking

Introduction

Pedagogy is the study of how best to teach. Many educators believe in the phrase "practice makes perfect" as a best practice, but it is often impractical to wait for all students in a class to practice until perfect before moving on to the next topic (Kennedy, 1994; Pearson & Flory, 2014). Therefore, a necessary decision is often made by educators, constrained by a schedule to teach all of the course topics within the given timeframe, that coursework must move on regardless of student performance. This limitation plagues learning.

Self-paced online courses minimize this limitation by allowing students more time to practice and master a difficult topic, nonetheless most students still have limiting schedules such as semester and graduation deadlines. Even though it may be unrealistic to allow all students in a class the opportunity to master a topic before moving on, there appears to be a few pedagogical decisions that can be made to promote mastery learning in an online course. One such decision is to allow a second attempt at the final exam.

Purpose

The purpose of this study is to explore the demographics and activities of university students who are allowed to retake a failed final exam in an online course. Brigham Young University (BYU) was the site of this study. It offers over 300 self-paced online university-level courses. Approximately 4% of student enrolled in these courses failed their first attempt of the final exam. The effectiveness from a mastery learning perspective of BYU's policy to allow a second attempt of the final exam is examined in this study.

Literature review

There is decades-old literature with compelling arguments regarding allowing or disallowing exam retakes. On one hand, by design in mastery learning environments, exams are supposed to be retaken (Kennedy, 1994). On the other hand, there are examples of other learning environments where retaking exams seemed unnecessary. The Keller Personalized System of Instruction, one such example, was thought to be so thorough and strong that in one study, retaking exams made no significant improvement in learning (Araujo & Semb, 1979). There are also more recent studies about retakes. These studies include comparing student exam scores between groups with limited retakes or unlimited retakes (Kennedy, 1994); and between groups that were allowed to drop a test score or retake a test (Abraham, 2000). There are case studies of the implementation of mastery learning in high schools (Pearson & Flory, 2014); and in higher education (Salinas, Kane-Johnson, & Vasil-Miller, 2008). There are also case studies of grading policies influencing student accountability (Wormeli, 2006); and grading policies influencing student motivation (Thompson & Grabau, 2004). All of this literature can be distilled into these six pedagogical areas with basic principles (see figure 1).

Pedagogical Area	Findings
Mastery learning	Retakes promote mastery learning
	Penalties for retakes suppress mastery learning
Individual learning	Retakes can become opportunities for individualized, targeted instruction and feedback
	Retakes promote individual pacing
	Retakes can accommodate varied learning styles
Teaching resources	Retakes require more resources
	Retakes happen outside of the normal flow of the class
Learner motivation	The last retake is often viewed as the only exam attempt that matters
	Each exam may not be taken seriously, if retakes are an option
	Retakes introduce the possible motivation to memorize exam questions rather than learn the breadth of the material
Grading	Retakes generally improve exam scores
	Grading of mastery is more accurate when retakes are allowed
Learner responsibility	Retakes encourage students to own their learning experience
	Retakes improve students' perseverance

Figure 1. Summary of recent studies regarding exam retakes.

A review of grading perspectives

The pedagogical rationale for grades shapes how we view grades and thus, exam retakes. Behavioral learning theories employ grades as consequences. Good grades strengthen current behavior and are extrinsic reinforcers of current study habits. Bad grades are intended to weaken current behavior and are known as punishers or unpleasant consequences. Grades are used to

influence the process of changing the current behavior into the desired behavior (Slavin, 2003). For example, a teacher may give grade points for attendance in class, if attendance is a desired behavior.

In most learning theories, both behavioral and cognitive, grades are also a feedback mechanism intended to establish evidence of learning. Graded assignments and tests are such feedback mechanisms, which "[establish] that the newly learned capability has reasonable stability and [provide] additional practice that serves to consolidate what has been learned" (Gagne, 1985, p. 255). For example, student output (e.g., assignment or exam), from a cognitive science perspective, is graded for correctness as an evaluation of problem-solving and memory skills.

Additionally, grades can be used to promote student competition such as grading on a curve. Grading on a curve is the sorting of any population of students along the natural statistical distribution curve. Grading on a curve still exists today, even if it says to the students, "Your effort and attainment don't matter after all, because I'll put you back in the same old slots. Your worth will always be determined in relation to the achievement of others. You can never be truly excellent or proficient if there is someone else who is a little better-or as good." (Bresee, 1976, p. 108).

Within some constructivist learning theories, being truly excellent is simply the transition from novice to expert (Sawyer, 2006). Grades are an indication of the degree to which the student demonstrates expertness in thinking, doing, and becoming. In this case, the goal is not to slot students into a natural curve, but to transition all students into experts. Stated differently, the goal here is that all students perform excellently and receive top grades.

In summary, grades can be used for many purposes, more purposes than have been discussed here. They are used to reinforce good behavior and deter bad behavior. They are used to establish evidence of learning. They are used to evaluate performance and correctness. They are used to promote competition and sort classmates. And they are used to indicate expertness. The perspective studied here is one that allows a single final exam retake and views grades as evidence of learning.

Research Questions

This study explores the demographics and activities of university students who retake a failed final exam in an online course. Specifically, the research questions are:

1. What are the demographic characteristics of university students who retake a failed final exam in an online course?
2. For what reasons did they think they failed the first attempt?
3. What outside resources did they use to study for each attempt?
4. How prepared did they feel for each attempt?
5. How many hours did they study for each attempt?
6. How heavily did they study each part of the course for each attempt?
7. How fast did they complete the exam for each attempt?

Method

This study employed a survey (see appendix) developed around the research questions that was sent to all university students who had retaken the final exam in an online course in the last 36 months. Those respondents who indicated they had failed their first attempt were included in the

purposive sample. This study provided frequencies of demographic categories, chi-square independence probabilities for demographic groupings with variables, a paired samples t-test for comparing total hours studied by exam attempt, and Wilcoxon signed-rank tests for comparing variable across the failed and retake exam attempts. This study adhered to procedures as outlined by the Institutional Review Board at Brigham Young University (who approved this study) to protect participants rights and ensure that ethical guidelines were followed.

Results

The survey was completed by 87 students who indicated they had failed their first attempt and who represented approximately 7% of all university students who had retaken the final exam in an online course in the last 36 months. The following tables display this sample's demographics and frequencies:

Table 1

Frequency of gender in sample

Gender (n = 87)	Percent
Male	39%
Female	61%

Table 2

Frequency of age in sample

Age (n = 87)	Percent
Under 18	2%
18-24	58%
25-34	26%
35-44	5%
45-54	7%
55-64	2%
65 or older	0%

Table 3

Frequency of class standing in sample

Class standing (n = 87)	Percent
Pre-freshman	2%
Freshman	8%
Sophomore	15%
Junior	16%
Senior	39%
Post-senior	20%

Table 4

Frequency of usual grades in college courses in sample

Grades (n = 87)	Percent
Mostly A's	38%
Mostly B's	59%
Mostly C's	2%
Mostly D's	0%
Mostly F's	0%

Table 5

Hours studied for failed final exam attempt and retake attempt

Hours studied (n = 87)	Failed attempt	Retake attempt
Mean	17.17	21.00
Median	9.00	10.00
Mode	10.00	10.00
Standard Deviation	26.42	34.67
Minimum	1.00	0.00
Maximum	150.00	224.00

Table 6

Percentage of students using outside the course resources for failed final exam attempt and retake attempt and Wilcoxon Signed-Rank Test results

Resources (n = 87)	Failed attempt	Retake attempt	Z	*p*
Internet	53%	52%	-0.229	0.819
Other	22%	21%	-0.378	0.705
Private tutor	14%	16%	-0.816	0.414
BYU free tutoring service	10%	15%	-1.265	0.206
Friend	10%	13%	-0.707	0.480
Other students in the course	8%	9%	-0.378	0.705
Other family members	8%	9%	-0.333	0.739
BYU instructor	6%	9%	-1.342	0.180
BYU teaching assistant	6%	1%	-2.000	0.046*
Parent	2%	5%	-1.414	0.157

*$p < 0.05$

Table 7

Frequency of study intensity for failed final exam attempt and retake attempt and Wilcoxon Signed-Rank Test results

Study Intensity (n = 87)	Did not study	Lightly studied	Studied	Heavily studied
Syllabus (Z = -2.754, p = 0.006)				
Failed Attempt	40%	39%	13%	9%
Retake Attempt	41%	23%	20%	17%
Self-checks (Z = -4.079, p = 0.000)				
Failed Attempt	19%	41%	24%	17%
Retake Attempt	21%	10%	40%	30%
Speedbacks "Quizzes" (Z = -3.785, p = 0.000)				
Failed Attempt	28%	30%	23%	19%
Retake Attempt	30%	7%	34%	30%
Past course exams (Z = -4.925, p = 0.000)				
Failed Attempt	25%	25%	31%	19%
Retake Attempt	19%	5%	31%	45%
Readings (Z = -5.211, p = 0.000)				
Failed Attempt	15%	33%	28%	24%
Retake Attempt	9%	12%	31%	48%
Assignments (Z = -5.545, p = 0.000)				
Failed Attempt	9%	30%	41%	21%
Retake Attempt	8%	6%	35%	51%
Photos (Z = -4.096, p = 0.000)				
Failed Attempt	49%	36%	12%	4%
Retake Attempt	42%	20%	23%	15%
Graphs (Z = -3.806, p = 0.000)				
Failed Attempt	40%	43%	11%	7%
Retake Attempt	39%	16%	27%	18%
Animations (Z = -3.566, p = 0.000)				
Failed Attempt	57%	31%	8%	4%
Retake Attempt	51%	11%	23%	14%
Videos (Z = -3.906, p = 0.000)				
Failed Attempt	48%	33%	12%	7%
Retake Attempt	45%	15%	18%	22%
Other (Z = -1.027, p = 0.305)				
Failed Attempt	68%	27%	6%	0%
Retake Attempt	68%	5%	11%	16%

Table 8

Frequency of exam completion speed for failed final exam attempt and retake attempt and Wilcoxon signed-rank test results

Completion speed (n = 87)	Failed attempt	Retake attempt
Extremely fast	1%	0%
Somewhat fast	18%	17%
Average	58%	48%
Somewhat slow	17%	26%
Extremely slow	6%	8%

$Z = -1.674$, $p = 0.094$

Table 9

Frequency of retake reasoning for sample

Retake reasoning (n = 87)	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
I wanted to retake the final exam because:					
I didn't study enough of the course material	33%	37%	7%	12%	12%
I found some final exam questions to be confusing	26%	34%	15%	14%	11%
I procrastinated studying for the final exam	20%	16%	13%	20%	31%
I get anxious taking final exams	18%	34%	9%	18%	21%
The final exam covered material not taught in the course	8%	20%	17%	31%	24%
The final exam covered too much course material	8%	27%	26%	26%	12%
I was usually tired when I studied	8%	18%	22%	17%	35%
I studied the wrong material	8%	29%	20%	27%	16%
I usually studied in a location with lots of distractions	6%	21%	17%	15%	41%
I took the final exam at a location with lots of distractions	4%	8%	20%	17%	51%
I didn't have enough time to finish the final exam	4%	8%	7%	21%	61%

Table 10
Frequencies of preparedness for failed final exam attempt and retake attempt

Resources (n = 87)	Failed attempt	Retake attempt
Very prepared	2%	28%
Prepared	28%	30%
Somewhat prepared	25%	33%
Neither prepared nor unprepared	5%	0%
Somewhat unprepared	18%	5%
Unprepared	15%	1%
Very unprepared	7%	3%

Several demographic groupings with variables resulted in significant chi-square independence probabilities. Female students studied self-checks more heavily for the failed exam attempt than male students $\chi^2(3, N = 87) = 8.346$, $p = 0.039$. Female students also studied Speedback (quizzes) more heavily for the retake attempt than male students $\chi^2(3, N = 87) = 8.844$, $p = 0.031$. Female students more strongly agreed with the statement "I was usually tired when I studied" than male students $\chi^2(4, N = 87) = 9.581$, $p = 0.048$. Female students more strongly agreed with the statement "I found some exam questions to be confusing" than male students $\chi^2(4, N = 87) = 10.613$, $p = 0.031$. Older students were more likely to use the teaching assistant as a resource for the retake attempt than younger students $\chi^2(5, N = 87) = 13.657$, $p = 0.018$. Students with lower class standing were more likely to use private tutors as a resource for both attempts than students with higher class standing; failed attempt $\chi^2(5, N = 87) = 15.047$, $p = 0.010$, retake attempt $\chi^2(5, N = 87) = 12.559$, $p = 0.028$. Students with lower class standing studied past course exams more heavily for the retake attempt than students with higher class standing $\chi^2(15, N = 87) = 26.225$, $p = 0.036$. Students with higher usual grades were more likely to use a private tutor as a resource for the failed attempt than students with lower usual grades $\chi^2(2, N = 87) = 7.967$, $p = 0.019$. Students with lower usual grades studied course videos more heavily for the failed attempt than students with higher usual grades $\chi^2(6, N = 87) = 14.402$, $p = 0.025$. Students with lower usual grades more strongly agreed with the statements "I was usually tired when I studied" $\chi^2(8, N = 87) = 15.995$, $p = 0.042$ and "I usually studied in a location with lots of distractions" $\chi^2(8, N = 87) = 17.203$, $p = 0.028$ than students with higher usual grades. No other variable groupings were found to be independently significant among gender, age, class standing, and usual grades.

A paired samples t-test was conducted to compare hours studied for the failed attempt and the retake attempt. There was not a significant difference in the hours studied for the failed attempt (M = 17.2, SD = 26.4) and the retake attempt (M = 21.0, SD = 34.7); $t(86) = -1.547$, $p = 0.125$. However, it could be said that the hours of study for the failed attempt could be added to the hours of study for the retake attempt. In other words, the retake attempt benefited from both the hours of study before and after the failed attempt. There was a significant difference in hours studied when taking this approach, that is, the hours of study for the failed attempt only (M = 17.2, SD = 26.4) were compared to the hours of study before and after the failed attempt (M = 38.2, SD = 57.2) based on a paired samples t-test; $t(86) = -5.650$, $p = 0.000$.

Wilcoxon signed-rank tests were conducted on preparedness, outside resources used, parts of the course studied, and exam completion speed. The student activity between the failed attempt and retake attempt elicited a statistically significant change in how prepared the students felt

($Z = -6.307$, $p = 0.000$). The median preparedness rating rose from (5) somewhat prepared to (6) prepared. The student activity between the failed attempt and retake attempt also elicited a statistically significant change in the use of teaching assistants ($Z = -2.000$, $p = 0.046$). The percent of students using the teaching assistants to study dropped from 6% for the failed attempt to 1% for the retake attempt. The use of all other outside resources did not significantly changed between attempts (see table 6 for Wilcoxon statistics). All of the parts of the course, that is, syllabus, self-checks, Speedbacks (quizzes), past course exams, readings, assignments, photos, graphs, animations, videos, and other were significantly more heavily studied between attempts except for the "other" category (see table 7 for Wilcoxon statistics). The student activity between takes did not prompt a significant change in the exam completion speed ($Z = -1.674$, $p = 0.094$).

Discussion and conclusion

The results of this study answered the seven research questions by describing the demographic characteristics of university students who retake a failed final exam in an online course (see tables 1 – 4), by detailing the reasons those students thought they failed (see table 9), by noting the outside resources used to study for each attempt (see table 6), by assessing the perceived preparedness for each attempt (see table 10), by analyzing the number of hours spent studying for each attempt (see table 5), by assessing how heavily each part of the course was studied for each attempt (see table 7), and by analyzing the exam completion speed for each attempt (see table 8). A few items were remarkable and are discussed below.

First, the class standing and usual grades demographics were somewhat unexpected. Those data show 59% were seniors or post-seniors and that 98% usually earned A's or B's in their college courses. With such high class standings and top grades, failing a final exam seemed unexpected. Future inquiry is required to explore this unusual trend.

Next, there were clearly three top reasons why students thought they failed the final exam. With more than half the students in agreement, the three reasons why students felt they failed the first attempt were: "I didn't study enough of the course material" (70% agreed), "I found some final exam questions to be confusing" (60% agreed), and "I get anxious taking final exams" (52% agreed). Not studying enough may be an indication of a planned retake. The literature did describe learner motivation such that only the retake was taken seriously. In other words, 70% of the students in this sample may have taken the final exam as a practice exam knowing they would retake it again. Also of note is that over half of the students who failed the final exam described themselves as getting anxious when taking final exams. The retake was likely a valuable accommodation for their anxiousness of test taking. They were likely less nervous for the retake, given the significant increase in perceived preparedness between attempts (see table 10).

Finally, remarkably, there were increases in how heavily every specific part of the course was studied between attempts. Even the syllabus was statistically significantly more heavily studied for the retake attempt. These study increases perhaps demonstrate that these students, as the literature suggested, owned their learning experience. In other words, having failed the final exam, they increased their study effort for the retake. This is an indication of learner responsibility.

Limitations of this study

This study was limited to university students taking online courses at a large, private university in Utah. Factors that influence demographics and study habits vary across institutions and locations making generalization of these results restricted. Similar studies at other institutions and locations may make generalizations more feasible.

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Appendix

Survey

Based on our mailing records, you requested a retake of the final exam for one of your BYU Independent Study courses. Why did you retake the final exam? (Mark all that apply)

- ☑ I failed my first attempt at the final exam (1)
- ☑ I wanted a better grade (2)
- ☑ Other, please describe (3) _____

What is your gender?

- ❍ Male (1)
- ❍ Female (2)

What was your age at the time of enrollment in your BYU Independent Study course?

- ❍ Under 18 (1)
- ❍ 18 - 24 (2)
- ❍ 25 - 34 (3)
- ❍ 35 - 44 (4)
- ❍ 45 - 54 (5)
- ❍ 55 - 64 (6)
- ❍ 65 or older (7)

What was your standing in college at the time of enrollment in your BYU Independent Study course?

- ❍ Pre-freshman (1)
- ❍ Freshman (2)
- ❍ Sophomore (3)
- ❍ Junior (4)
- ❍ Senior (5)
- ❍ Post-senior (6)

What kind of grades do you usually get in college courses?

- ❍ Mostly A's (1)
- ❍ Mostly B's (2)
- ❍ Mostly C's (3)
- ❍ Mostly D's (4)
- ❍ Mostly F's (5)

How many hours did you spend studying specifically for your first attempt of the final exam? Type the number of study hours:_____

How many hours did you spend studying between your first attempt and your last attempt of the final exam? Type the number of study hours:_____

How prepared did you feel for your first attempt of the final exam?

- ❍ Very unprepared (1)
- ❍ Unprepared (2)
- ❍ Somewhat unprepared (3)
- ❍ Neither prepared nor unprepared (4)
- ❍ Somewhat prepared (5)
- ❍ Prepared (6)
- ❍ Very prepared (7)

How prepared did you feel for your last attempt of the final exam?

- ❍ Very unprepared (1)
- ❍ Unprepared (2)
- ❍ Somewhat unprepared (3)
- ❍ Neither prepared nor unprepared (4)
- ❍ Somewhat prepared (5)
- ❍ Prepared (6)
- ❍ Very prepared (7)

What outside resources did you use to study for your first attempt of the final exam? Mark all the outside resources you used:

- ☑ BYU Independent Study free tutoring service (1)
- ☑ BYU instructor (2)
- ☑ BYU teaching assistant (TA) (3)
- ☑ Private tutor (4)
- ☑ Other students in the same course (5)
- ☑ Parent (6)
- ☑ Other family member (7)
- ☑ Friend (8)
- ☑ Internet (9)
- ☑ Other, please describe (10) _____

What outside resources did you use to study for your last attempt of the final exam? Mark all the outside resources you used:

- ☑ BYU Independent Study free tutoring service (1)
- ☑ BYU instructor (2)
- ☑ BYU teaching assistant (TA) (3)
- ☑ Private tutor (4)
- ☑ Other students in the same course (5)
- ☑ Parent (6)
- ☑ Other family member (7)
- ☑ Friend (8)
- ☑ Internet (9)
- ☑ Other, please describe (10) _____

Which parts of the course did you study for your first attempt of the final exam?

	Did not study for first attempt (1)	Lightly studied for first attempt (2)	Studied for first attempt (3)	Heavily studied for first attempt (4)
Syllabus (1)	❍	❍	❍	❍
Self-checks (2)	❍	❍	❍	❍
Speedbacks (3)	❍	❍	❍	❍
Past course exams (4)	❍	❍	❍	❍
Readings (5)	❍	❍	❍	❍
Assignments (6)	❍	❍	❍	❍
Photos (7)	❍	❍	❍	❍
Graphs (8)	❍	❍	❍	❍
Animations (9)	❍	❍	❍	❍
Videos (10)	❍	❍	❍	❍
Other (11)	❍	❍	❍	❍

Which parts of the course did you study for your last attempt of the final exam?

	Did not study for last attempt (1)	Lightly studied for last attempt (2)	Studied for last attempt (3)	Heavily studied for last attempt (4)
Syllabus (1)	❍	❍	❍	❍
Self-checks (2)	❍	❍	❍	❍
Speedbacks (3)	❍	❍	❍	❍
Past course exams (4)	❍	❍	❍	❍
Readings (5)	❍	❍	❍	❍
Assignments (6)	❍	❍	❍	❍
Photos (7)	❍	❍	❍	❍
Graphs (8)	❍	❍	❍	❍
Animations (9)	❍	❍	❍	❍
Videos (10)	❍	❍	❍	❍
Other (11)	❍	❍	❍	❍

How fast did you complete your first attempt of the final exam compared to other course final exams you have taken in the past?

- ❍ Extremely fast (1)
- ❍ Somewhat fast (2)
- ❍ Average (3)
- ❍ Somewhat slow (4)
- ❍ Extremely slow (5)

How fast did you complete your last attempt of the final exam compared to other course final exams you have taken in the past?

- ❍ Extremely fast (1)
- ❍ Somewhat fast (2)
- ❍ Average (3)
- ❍ Somewhat slow (4)
- ❍ Extremely slow (5)

After my first attempt of the final exam, I wanted to retake it because:

	Strongly agree (1)	Somewhat agree (2)	Neither agree nor disagree (3)	Somewhat disagree (4)	Strongly disagree (5)
I wanted to retake it because I studied the wrong material. (1)	❍	❍	❍	❍	❍
I wanted to retake it because I didn't study enough of the course material. (2)	❍	❍	❍	❍	❍
I wanted to retake it because I procrastinated studying for the final exam. (3)	❍	❍	❍	❍	❍
I wanted to retake it because I was usually tired when I studied. (4)	❍	❍	❍	❍	❍
I wanted to retake it because I usually studied in a location with lots of distractions. (5)	❍	❍	❍	❍	❍
I wanted to retake it because I didn't have enough time to finish the final exam. (6)	❍	❍	❍	❍	❍
I wanted to retake it because, in general, I get anxious taking final exams. (7)	❍	❍	❍	❍	❍
I wanted to retake it because the final exam covered material not taught in the course. (8)	❍	❍	❍	❍	❍
I wanted to retake it because I found some final exam questions to be confusing. (9)	❍	❍	❍	❍	❍
I wanted to retake it because the final exam covered too much course material. (10)	❍	❍	❍	❍	❍
I wanted to retake it because I took the final exam at a location with lots of distractions. (11)	❍	❍	❍	❍	❍

Please describe any other reasons you wanted to retake the final exam.

_____

Last Question: What else made a difference between your first attempt and your last attempt of the final exam?

_____

About the author

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Editor's Note: When, and to what extent, is a response inappropriate and what is the likely result? Is discussion in an online classroom comparable to discussion in a face-to-face classroom? This is a detailed study to determine what is significant to guide students and instructors on class norms for disclosure.

Student perceptions of appropriate and inappropriate student self-disclosure in online courses

Yolanda Harper, Paul Gesn
USA

Abstract

The level of student self-disclosure in campus-based college classes has been shown to impact students' perceptions of their classmates, with high levels of inappropriate disclosures having a negative effect on perceptions. Our goal was to replicate these findings in the online course environment. Relevance of self-disclosures predicted student perceptions of the appropriateness of self-disclosures. We tested the effect of level of self-disclosure in discussion posts and relevance of the discussion on perceptions of discussion posts along four dimensions. We also tested the effect of these two independent variables on perceptions of the individual who wrote the discussion post. Unexpectedly high levels of disclosure had a negative effect on judgments of the discussion posts and judgments of student competence and social attraction.

Keywords: self-disclosure, student perceptions, student expectations, classroom norms, online education, course design, violation of norms, online communication, online course discussion forums, rapport, judgments of competence, first impressions

Introduction

Students and instructors approach courses with expectations based on implicit norms about what is and is not appropriate classroom behavior (e.g., Caboni, Hirschy, & Best, 2004). In face-to-face classroom settings, many of these expectations and norms are generally agreed upon (e.g., raising one's hand to speak, not carrying on side conversations when an instructor is lecturing, etc.). However, norms regarding other important classroom behaviors are often less clear. For example, what is an appropriate amount and type of self-disclosure for a classroom setting? The norms appear to be even more unclear in online classrooms. Given the importance of discussion and student participation in online courses, this is an issue which deserves further examination.

With regard to the face-to-face classroom setting, Frisby and Sidelinger (2013) provided evidence that there is agreement on the appropriateness of certain aspects of self-disclosure. The results of their study showed that when certain components of self-disclosure were unexpected and violated an individual's norms for classroom behavior, the disclosure was judged as inappropriate, and the individuals making the self-disclosures were often viewed in an unfavorable light. Specifically, "student disclosures are inappropriate when they happen frequently, are negative, irrelevant to course materials, or violate student expectations for classroom norms" (Frisby & Sidelinger, 2013, p. 241).

Although self-disclosure is considered to be one of the most salient and critical behaviors in computer mediated communication (Jiang, Bazarova, & Hancock, 2011), investigating self-disclosure in online classrooms is an emerging research focus area. However, the potential interpersonal and pedagogical implications of this research are significant. According to Booth (2012), self-disclosure has been somewhat of a double-edged sword. There has been a trend for instructors to incorporate more authentic and integrative assignments in their courses. These types of assignments require students to make explicit connections between course theory/research and real world/applied settings. Students are often encouraged to make the course material personally

relevant and to draw on their own life experiences. This demands a certain level of self-disclosure. Without explicit guidelines from the instructor, some students may disclose information that their classmates and/or instructors find too personal and inappropriate for a college classroom (Booth, 2012). At the extreme, this level of disclosure could even be upsetting to one's classmates and serve to cast an individual in a negative light for the remainder of the course session.

The issue of the appropriateness of student disclosures is particularly relevant in online courses, in which formal discussion forums comprise an integral part of the course structure. The majority of studies conducted on students' and instructors' perceptions of self-disclosure in the classroom have focused on the face-to-face classroom setting. The purpose of the proposed research study is to determine if these findings are relevant to the online setting. Because discussion forums are such an integral component of online courses, it is essential to understand the types of disclosures that are considered inappropriate by a significant percentage of the students or by the instructor. In cases where the inappropriateness is extreme, the issue could have potential implications for student retention and performance. If students do not feel comfortable in a course, there is a higher probability that they will drop the course. In addition, students' rapport with their classmates and their feelings of connectedness can affect their performance in a course (e.g., Frisby & Martin, 2010). If a student's posts are judged as inappropriate, the negative perceptions by his or her classmates can affect the development of rapport, which can, in turn, potentially hinder the student's performance in the course.

The purpose of this study is to assess the perceptions of appropriateness/inappropriateness of students' disclosures in the online classroom and how these perceptions affect judgments of competence and likability. Whereas Frisby and Sidelinger (2013) used students who had participated in a traditional, face-to-face classroom setting, our intent was to replicate their findings in an online context. Specifically, we expected students to evaluate their classmates' disclosures as inappropriate when expectations of normative online classroom behavior are violated. In addition, it was presumed that negative expectation violations would lead to perceptions of decreased competence and likability of their classmates.

The following hypotheses were tested in this study:

H1: Ratings of disclosure amount, relevance, and valence will predict judgments of the appropriateness of student disclosures.

H2: Discussion posts that contain high levels of perceived unexpected self-disclosure and that do not answer the question with accurate and relevant information will be rated negatively on measures of appropriateness, disclosure relevance, disclosure amount, and disclosure valence.

H3: Students who write discussion posts that contain high levels of unexpected self-disclosure and that do not answer the question will be rated negatively on measures of competence and social attraction.

Method

Participants

Participants included 117 undergraduate students who were taking online courses at a large university that serves nontraditional students, primarily through online programs. In their online courses, students were provided a link, via instructors posting an announcement, which allowed them to participate in the study. Participants were randomly assigned to one of six experimental conditions as part of a 3 (Level of Disclosure) X 2 (Answers Question) study design.

Level of Disclosure was operationalized by three levels: expected disclosure, unexpected disclosure, and no disclosure. In the expected disclosure condition, the level of self-disclosure in the posts was moderate and not overly personal; that is, the posts were designed to be within acceptable boundaries in a classroom setting. In the unexpected disclosure condition, the level of self-disclosure was extreme and very personal in nature; these posts were designed to be outside acceptable boundaries in a classroom setting. Answers Question was operationalized by two levels: Does Answer Question and Does Not Answer Question. Posts in the Does Answer Question condition posts that answered the question and clearly contained accurate and relevant content, and posts that did not answer the question with accurate and relevant content (i.e., were off-topic). Table 1 provides a summary of the independent and dependent variables.

Table 1

Summary of independent and dependent variables

Independent Variables	
Level of Disclosure	**Response Answers Question?**
No Disclosure	Answers Question (On-Topic)
Expected Disclosure	Does Not Answer Question (Off-Topic)
Unexpected Disclosure	
Dependent Variables	
Appropriateness	
Disclosure Relevance	
Disclosure Amount	
Disclosure Valence	
Competence	
Social Attraction	

Materials and procedure

Participants read two discussion posts in response to two representative online discussion forum questions. The two discussion questions were as follows: (1) Discuss the roles of nature and nurture in human development and (2) How can an accurate assessment of one's interests, abilities, and personality type assist in making satisfying career choices? For each of the two discussion questions, the researchers wrote six responses that were representative of each experimental condition.

Participants rated the discussion responses on the following four scale dimensions: *Appropriateness, Disclosure Relevance, Disclosure Amount*, and *Disclosure Valence*. Participants rated the writers of the discussion responses on the following two scale dimensions: *Competence* and *Social Attraction*. Appropriateness of the discussion posts was rated using the Expectedness/ Appropriateness Scale adapted from McPherson & Liang (2007). This scale contains ten items on which respondents make judgments of appropriateness, using a 7-point semantic differential scale. The dimensions of disclosure amount, disclosure relevance, and disclosure valence were rated using a modified version of the Teacher Self-Disclosure Scale (Cayanus & Martin, 2008). The modifications followed those used by Frisby and Sidelinger (2013) for use with students. This scale contains 14 items measured on a 7-point Likert-type scale. Competence was rated using a modified version of the Competence subscale of the Teacher Credibility Scale

(McCroskey & Tevin, 1999). The modifications followed those used by Frisby and Sidelinger (2013) for use with students. This scale contains six items measured on a 7-point semantic differential scale. Likability was rated using the Social Attraction subscale of the Interpersonal Attraction Scale (McCroskey & McCain, 1974). This scale contains five items measured on a 7-point Likert-type scale.

When participants clicked on the link in their online courses allowing them to participate in the study, they were taken to a Qualtrics Survey Software page on the internet. They were first presented with an informed consent form which provided them with an overview of the study. Agreeing to continue with the study and entering their names brought them to the next page, which was a brief overview of the procedure. The next screen then presented participants with the two discussion questions and responses representative of the experimental condition to which they had been randomly assigned. After reading the discussion questions and responses, participants were presented with each scale one at a time. Moving on to the next scale was contingent upon completely filling out the previous scale. After responding to the final scale, participants were thanked for their participation in the study.

Table 1

Summary of experimental conditions

Independent Variables		
Level of Disclosure	*Response Answers Question?*	
	Answers Question	Does Not Answer Question
	Six Experimental Conditions	
No Disclosure	No Disclosure Answers Question	No Disclosure Does Not Answer Question
Expected Disclosure	Expected Disclosure Answers Question	Expected Disclosure Does Not Answer Question
Unexpected Disclosure	Unexpected Disclosure Answers Question	Unexpected Disclosure Does Not Answer Question

Results

Manipulation Checks

An independent group of raters judged the constructed discussion responses on how well they represented each experimental condition of disclosure level. The raters judged the discussion responses as meeting the criterion of discussion disclosure for each condition. For example, raters agreed that the discussion posts containing overly personal disclosures should be placed in the Unexpected Disclosure condition, and raters agreed that the discussion posts that were off-topic should be placed in the Does Not Answer condition.

Checking statistical assumptions

Multiple regression. Regression diagnostics were conducted to determine whether there were any unusually large residuals and if so, whether any of the unusual cases were having undue influence on the regression model. Eight cases out of 114 had residuals just slightly larger than +2 or smaller than -2. Two cases had residuals larger than +3. Hat diagnostics indicated that none of these cases had undue leverage on the regression model, and Cook's D indicated that none of

these cases had undue influence on the regression model. Therefore the decision was made to keep all cases in the estimation of the regression model.

MANOVA. The assumption of normality was tested using the Shapiro-Wilk Normality Test within the six experimental groups for each dependent variable. On the Disclosure Scale, the assumption of normality was met in all cases except for the group that did not answer the question and also did not include any self-disclosure in their discussion post responses. The assumption of homogeneity of variance was tested for each dependent variable using Levene's Test for Homogeneity. This assumption was met for each dependent variable except Social Attraction. Multivariate normality was tested using Royston's Multivariate Normality Test within each experimental condition. This assumption was met within each experimental condition. Finally, a visual inspection of the covariance matrices for each experimental group allowed us to check the assumption of the homogeneity of covariances. No significant violations of this assumption were apparent. All assumptions were met in the vast majority of cases, and in none of the exceptions noted previously was more than one assumption violated. Because of the robustness of the MANOVA procedure to violations of assumptions, the few violations that were noted were deemed not to be problematic.

An additional assumption of MANOVA is that the dependent variables are significantly correlated. The intercorrelations for all dependent variables can be found in Table 2. The moderate correlations among the dependent variables provide a statistical and theoretical basis for conducting MANOVA analyses.

Table 2

Intercorrelations among dependent measures

	Appropriateness	Disclosure Relevance	Disclosure Valence	Disclosure Amount	Competence	Social Attraction
Appropriateness	1.00	.53	.37	.38	.73	.58
Disclosure Relevance		1.00	.37	.43	.64	.38
Disclosure Valence			1.00	.60	.41	.45
Disclosure Amount				1.00	.51	.38
Competence					1.00	.77
Social Attraction						1.00

Hypothesis 1: Judgments of disclosure appropriateness

In our first hypothesis, we stated that judgments of the appropriateness of the discussion posts would be predicted by *Disclosure Relevance*, *Disclosure Valence*, and *Disclosure Amount*. The overall regression model, in which *Appropriateness* was regressed on these three predictor variables, was significant, $F(3, 110) = 17.59$, $p < .001$, $R^2 = 0.31$. The regression weights and associated p values for the individual predictors are reported in Table 3.

Table 3
Regression of appropriateness on disclosure relevance, disclosure valence, and disclosure amount

	Estimate	β weight	Standard error	*t*	*p* value
Intercept	8.12	--	3.39	2.39	< .05
Disclosure Relevance	0.28	0.10	0.27	1.01	0.31
Disclosure Valence	0.90	0.44	0.18	4.96	< .001
Disclosure Amount	0.33	0.14	0.24	1.40	0.16

As can be seen in this table, Disclosure Relevance was a significant predictor of Appropriateness ($\beta = 0.44$, $p < .001$), whereas Disclosure Valence and Disclosure Amount were not significant predictors of Appropriateness.

Hypothesis 2: Effects of level of disclosure and answers question on ratings of discussion post appropriateness, disclosure relevance, disclosure valence, and disclosure amount

H2: Omnibus MANOVA. A 3 (Level of Disclosure) X 2 (Answers Question) MANOVA was performed with Appropriateness, Disclosure Relevance, Disclosure Valence, and Disclosure Amount as dependent variables. As indicated by Pillai's Trace, there was a significant main effect of Level of Disclosure on the dependent variables, $V = 0.58$, $F(8, 216) = 10.93$, $p < .001$.

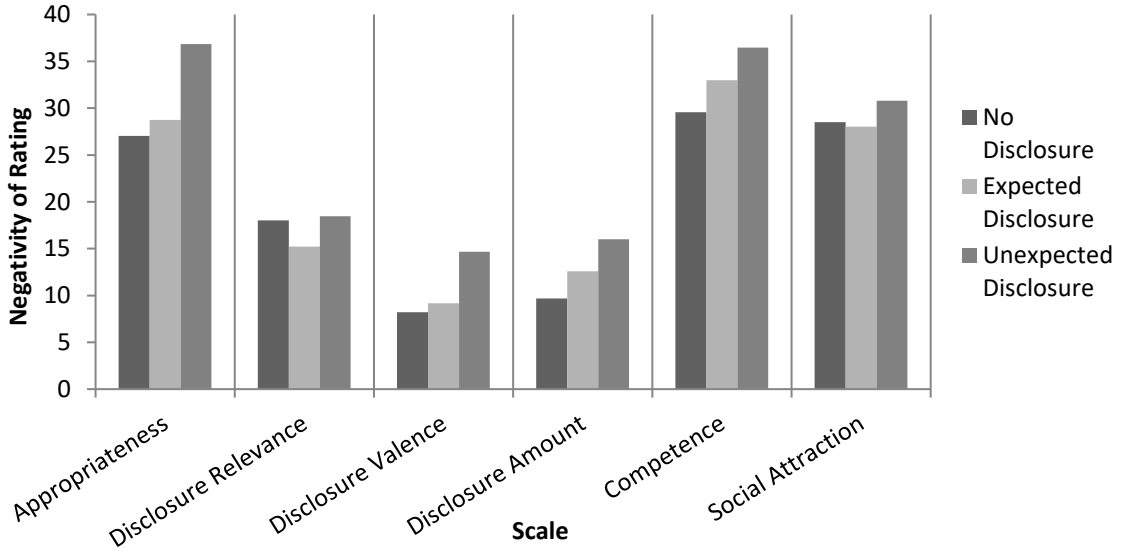

Figure 1. Mean participant ratings on scales for independent variable level of disclosure.

Note: Larger ratings indicate more negative evaluations. Because the scale of measurement is different for each scale, comparisons should be made only within each scale. Direct mean comparisons across scales cannot be made.

Figure 1 shows the means for each level of Level of Disclosure. There was a significant main effect of Answers Question on the dependent variables, V = 0.21, F(4, 107) = 7.01, p < .001.

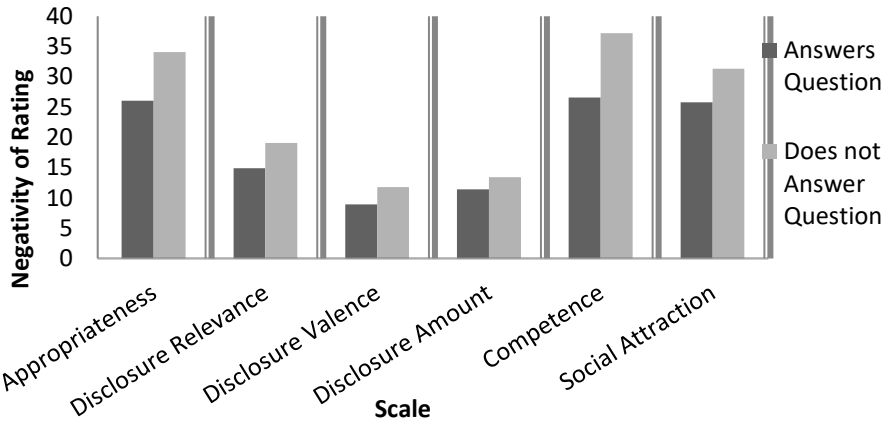

Figure 2. Mean participant ratings on scales for independent variable Answers Question.

Note: Larger ratings indicate more negative evaluations. Because the scale of measurement is different for each scale, comparisons should be made only within each scale. Direct mean comparisons across scales cannot be made.

Figure 2 shows the means for each level of *Answers Question.* In addition, there was a significant interaction between *Level of Disclosure* and *Answers Question*, $V = 0.16$, $F(8, 216) = 2.38$, $p < .05$. These mean values are presented in Table 4.

Table 4

Means of dependent measures

	Level of Disclosure of Discussion Response		
Response Answers Question?	**No Disclosure**	**Expected Disclosure**	**Unexpected Disclosure**
Appropriateness			
Answers Question	19.15	22.00	36.82
Does Not Answer Question	33.58	31.96	36.86
Disclosure Relevance			
Answers Question	15.75	10.54	16.65
Does Not Answer Question	19.92	17.43	19.95
Disclosure Valence			
Answers Question	6.60	5.00	14.24
Does Not Answer Question	9.54	11.17	15.05
Disclosure Amount			
Answers Question	9.50	10.00	14.59
Does Not Answer Question	9.83	13.83	17.14
Competence			
Answers Question	22.53	23.00	33.41
Does Not Answer Question	35.17	37.74	38.95
Social Attraction			
Answers Question	24.32	22.36	29.88
Does Not Answer Question	31.83	30.74	31.48

Note. Item responses are keyed in the negative direction. Higher values indicate less appropriateness, relevance, etc

Hypothesis 2: Follow-up ANOVA analyses for appropriateness

Because the omnibus MANOVA was significant for both independent variables, we conducted follow-up ANOVA analyses on each dependent variable in order to determine the nature of the effects. For the dependent variable *Appropriateness*, there was a significant main effect for *Level of Disclosure*, $F(2, 111) = 8.93$, $p < .001$, $\omega^2 = 0.10$. Tukey tests were used to compare the mean *Appropriateness* ratings for the three *Level* of *Disclosure* conditions. Discussion posts with unexpected personal disclosures were rated as significantly less appropriate than posts with no personal disclosures and posts with expected personal disclosures. Mean appropriateness ratings of discussion posts with no personal disclosure and posts with expected personal disclosure were not significantly different.

There was also a significant main effect for *Answers Question*, $F(2, 111) = 14.95$, $p < .001$, $\omega^2 = 0.09$. Discussion posts that did not answer the question presented in the discussion prompt were rated as less appropriate than discussion posts that did answer the discussion question.

The interaction between *Level of Disclosure* and *Answers Question* was significant, $F(2, 111) = 4.21$, $p < .05$, $\omega^2 = 0.04$.

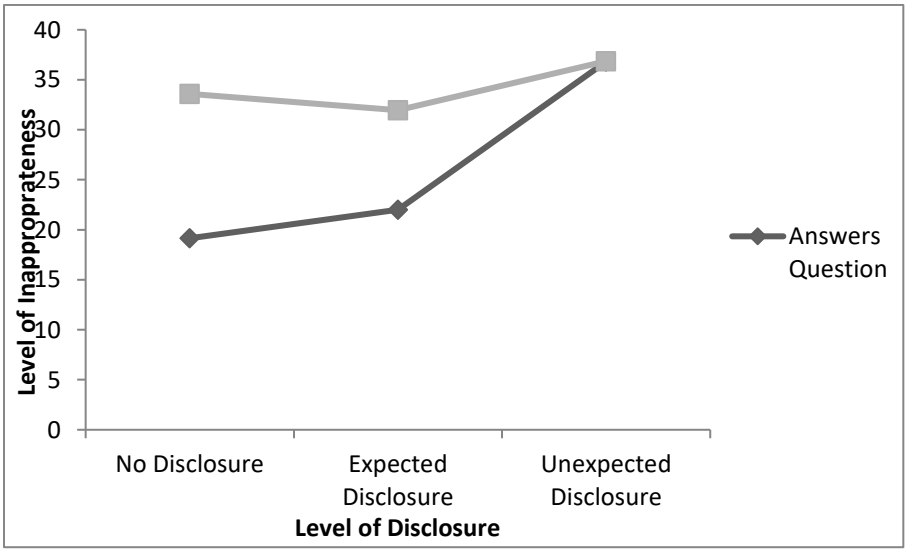

Figure 3. **Interaction between the independent variables *level of disclosure* and *answers question* for the dependent variable *appropriateness*.**

Figure 3 illustrates the interaction between *Level of Disclosure* and *Answers Question*. When the discussion question was not answered and was off-topic, the level of disclosure was not relevant to the ratings; participants in all three disclosure levels rated the discussion posts as similarly negative. However, when the discussion was answered and was on-topic, level of disclosure was relevant. Discussion posts that answered the discussion question were rated as significantly less appropriate by participants in the Unexpected Disclosure condition than by participants in the Expected Disclosure and No Disclosure conditions.

H2: Follow-up ANOVA analyses for disclosure relevance. For the dependent variable *Disclosure Relevance*, there was a significant main effect for *Level of Disclosure*, $F(2, 110) = 4.62$, $p < 0.05$, $\omega^2 = 0.05$. Tukey HSD tests showed that mean ratings of disclosure relevance were significantly different for the Unexpected Disclosure group and the Expected Disclosure group, but no other group comparisons were statistically significant. The self-disclosure of the discussion posts for the Unexpected Disclosure group was rated as less relevant than the self-disclosure of the Expected Disclosure group.

The main effect of *Answers Question* was also statistically significant, $F(1, 110) = 17.37$, $p < 0.001$, $\omega^2 = 0.12$. The self-disclosure of the discussion posts that satisfactorily answered the discussion question was rated as more relevant to the post than was the self-disclosure of the discussion posts that were off-topic and did not answer the question.

There was no statistically significant interaction between *Level of Disclosure* and *Answers Question* for the dependent variable *Disclosure Relevance*.

H2: Follow-up ANOVA analyses for disclosure valence

For the dependent variable *Disclosure Valence*, there was a significant main effect for *Level of Disclosure*, $F(2, 110) = 24.68$, $p < 0.001$, $\omega^2 = 0.27$. Tukey HSD tests indicated that the emotional valence of discussion posts in the Unexpected Disclosure condition was rated as significantly more negative than the valence of discussion posts in the Expected Disclosure and No Disclosure conditions; the latter two conditions did not significantly differ in the mean ratings of disclosure valence.

The main effect of *Answers Question* was also statistically significant, $F(1, 110) = 13.19$, $p < 0.001$, $\omega^2 = 0.07$. The emotional valence of the personal disclosure of discussion posts that were off-topic was rated as significantly more negative than the emotional valence of the personal disclosure of discussion posts that answered the question and were on-topic.

There was no statistically significant interaction between *Level of Disclosure* and *Answers Question* for the dependent variable *Disclosure Valence*.

H2: Follow-up ANOVA analyses for disclosure amount

For the dependent variable *Disclosure Amount*, there was a significant main effect for *Level of Disclosure*, $F(2, 110) = 24.80$, $p < 0.001$, $\omega^2 = 0.28$. Tukey HSD tests showed that the amount of personal disclosure was judged as most excessive for the Unexpected Disclosure condition; the mean disclosure amount in the Unexpected Disclosure condition was significantly higher than the mean disclosure amount in the Expected Disclosure and No Disclosure conditions. The mean disclosure amount in the Expected Disclosure condition was significantly higher than the mean disclosure amount in the No Disclosure Condition.

There was a significant main effect for *Answers Question*, $F(1, 110) = 6.96$, $p < 0.001$ $\omega^2 = 0.04$. The amount of personal disclosure was rated as more excessive in the Not Answers Question condition than in the Answers Question condition.

There was no statistically significant interaction between *Level of Disclosure* and *Answers Question* for the dependent variable *Disclosure Amount*.

Hypothesis 3: Ratings of discussion post writer-competence and social attraction

H3: Omnibus MANOVA

A 3 (*Level of Disclosure*) X 2 (*Answers Question*) MANOVA was performed with *Competence* and *Social Attraction* as dependent variables. Figure 1 shows the means for each level of *Level of Disclosure*. Figure 2 shows the means for each level of *Answers Question.* These values are presented in Table 4. Pillai's Trace indicated that there was a significant main effect of *Answers Question* on the dependent variables, $V = 0.19$, $F(2, 107) = 8.60$, $p < .001$. The main effect of *Level of Disclosure* was not statistically significant, nor was the interaction between *Answers Question* and *Level of Disclosure*.

H3: Follow-up ANOVA analyses for competence

Because the omnibus MANOVA was significant for the independent variable, *Answers Question*, we conducted follow-up ANOVA analyses on each dependent variable in order to determine the

nature of the effects. For the dependent variable *Competence*, there was a significant main effect for *Answers Question*, $F(1, 113) = 17.084$, $p < .001$, $\omega^2 = 0.13$. Writers of the discussion posts that answered the question and were on-topic were rated as more competent that writers of the discussion posts that did not answer the discussion question and were off-topic.

H3: Follow-up ANOVA Analyses for Social Attraction

For the dependent variable *Social Attraction*, there was a significant main effect for *Answers Question*, $F(1, 112) = 11.75$, $p < .001$, $\omega^2 = 0.09$. Writers of the discussion posts that were on-topic and answered the discussion question were rated as more interpersonally attractive in a social setting than writers of the discussion posts that were off-topic and did not answer the discussion question.

Discussion

Inappropriate student disclosure has important implications in the online classroom, where participation in discussion forums is such a major component of courses. The findings from this study shed light on online students' perceptions of what is and is not appropriate or expected in discussions. We first set out to determine how participants make judgments of the appropriateness of discussion posts written by other individuals. Our first hypothesis stated that *Appropriateness* of discussion posts would be significantly predicted by *Disclosure Relevance*, *Disclosure Valence*, and *Disclosure Amount*. This hypothesis was partially confirmed, in that *Appropriateness* was significantly predicted by the relevance of the disclosure to the discussion topic; however, it was not significantly predicted by the valence or amount of the disclosure. The lack of predictive validity of *Disclosure Valence* and *Disclosure Amount* was somewhat unexpected since Frisby and Sidelinger (2013) found that all three variables were significant predictors of *Appropriateness*. The results of the present study could partly be due to the manner in which the discussion posts were constructed. *Disclosure Relevance* was specifically and carefully manipulated in order to create the independent variable *Answers Question*. *Disclosure Amount* and *Disclosure Valence* were addressed in the discussion posts, but not in the deliberate, thorough way that *Disclosure Relevance* was. Future research will follow up on this component of the study, manipulating *Disclosure Amount* and *Disclosure Valence* to a greater degree.

We next examined participants' judgments of the content of the discussion posts on four dependent measures: *Appropriateness*, *Disclosure Relevance*, *Disclosure Valence*, and *Disclosure Amount*. Specifically, we hypothesized that unexpected levels of self-disclosure and not adequately answering the discussion question would result in negative ratings on all four dependent measures. Across all four dependent variables, the general pattern was a significant main effect of both *Level of Disclosure* and *Answers Question*.

Compared to no disclosure and expected levels of disclosure, unexpected levels of disclosure in the discussion posts had a negative effect on judgments of the discussion posts. Specifically, compared to discussion posts with no disclosure or expected levels of disclosure, discussion posts with unexpected levels of disclosure were judged as less appropriate, as not being as relevant to the discussion question, as having a more negative valence or tone, and as having too much disclosure, The only significant difference between the no disclosure and expected disclosure conditions was for the dependent variable, *Disclosure Amount*. This is not surprising, given that the judgment being made was regarding the overall level of disclosure in the post.

Perhaps the most interesting finding was a significant interaction between *Level of Disclosure* and *Answers Question* for the dependent variable *Appropriateness*. When the discussion posts did not answer the discussion questions (that is, answers were off-topic), the posts were judged as less appropriate than posts that did answer the discussion question (that is, the answers were on-topic). Interestingly, for these posts that did not answer the discussion question, the level of disclosure in

the posts did not make a difference; posts with no disclosure, expected disclosure, and unexpected disclosure were judged as equally inappropriate if the post did not answer the discussion question. However, for posts that did answer the discussion question, the level of disclosure did make a difference. Even for discussion posts that answered the discussion question, posts that contained an unexpected level of disclosure were judged as significantly less appropriate than posts that had no disclosure or expected levels of disclosure.

Finally, we examined participants' judgments of the individuals who wrote the discussion posts; participants made their judgments on the dependent measures of *Competence* and *Social Attraction*. Specifically, we hypothesized that expected levels of disclosure and not answering the question would result in judgments of the students as less competent and less socially attractive. Because the main effect of *Level of Disclosure* was not significant in the MANOVA, we examined only *Answers Question* in the follow up analyses. Participants judged individuals whose posts did not answer the discussion question as less competent and less socially attractive than individuals whose posts did answer the discussion question. The level of disclosure did not affect participants' judgments of the discussion post writers themselves. This latter finding might be explained by research indicating self-disclosure is highly prevalent (perhaps normative) in online interpersonal interactions and that there is a positive association between self-disclosure and friendship development (e.g., Parks & Floyd, 1996; Parks & Roberts, 1998; Valkenburg & Peter, 2009).

The results of the current investigation have important implications for the online classroom where a primary requirement is interacting with one's classmates in discussion forums. In making evaluative judgments both of discussion posts themselves and of the writers of the discussion posts, the primary factor appears to be whether the discussion post actually answers the discussion question and stays on-topic. When discussion posts do not answer the question and are off-topic, readers of the posts judge them to be less acceptable and more negative. These negative judgments extend to the individuals who wrote the posts; they are viewed as less competent and as less interpersonally attractive. The level of disclosure in discussion posts also has an effect on evaluative judgments of the posts, but the effect is primarily relevant when the discussion posts answer the discussion question and are on-topic. Even if a discussion post answers the discussion question, if the level of self-disclosure is unacceptable and too high, the post may still be evaluated negatively.

A potential limitation of the current study is that student participants in this study were not actually responding to discussion posts with other online students in a live course, and thus, they and had no realistic expectation of future interaction with the discussion post writers. These factors might have limited the context for making interpersonal judgments. Despite this limitation, the fact that significant differences in student ratings were found based on one interaction is noteworthy in light of the literature suggesting that implicit first impressions are less flexible and less easily reversed than explicit first impressions (e.g., Boucher & Rydell, 2012; Gregg, Seibt, & Banaji, 2006; Wyer, 2010).

Future research projects include (1) examining the precise factors that students use in making their judgments of expectedness and acceptability, including obtaining a better understanding of the roles of disclosure valence and disclosure amount; (2) determining why level of disclosure was not a significant factor in perceptions of competence and social attraction; (3) exploring linkages between self-disclosure and interpersonal judgments in the context of ongoing online classroom relationships, and (4) assessing faculty perceptions of student self-disclosure. We initially intended to include the results of analyses of faculty perceptions of student self-disclosure in this paper; however, we were not able to collect sufficient faculty data to produce valid statistical results.

Preliminary results of the faculty data we did collect look promising, as the patterns of judgments of the discussion posts and the individuals who wrote the discussion posts were similar to the results for the student data. As was true for the student survey, ratings of discussion posts were more negative for posts in which disclosure was unexpected as compared to posts with expected disclosure or no disclosure. However, unlike for the student survey, the main effect of level of disclosure on ratings of competence and social attraction of the individual who wrote the post was significant. When disclosure was unexpected, the individuals were rated as less competent and less socially attractive. Discussion posts that did not answer the question were rated as less appropriate and less relevant than posts that did answer the question. Individuals whose posts did not answer the question were rated as less competent. Perhaps the most interesting of the preliminary findings for faculty perceptions was that posts that contained unacceptable self-disclosure were given a lower overall average grade by faculty participants than posts that had acceptable disclosure or no disclosure.

Conclusion and implications

The purpose of this study was to assess the perceptions of appropriateness and inappropriateness of students' disclosures in the online classroom and how these perceptions affect judgments about the student and evaluations of the quality of the student's work. Given the central role that discussions occupy in online courses, it is important for faculty and university staff to be aware of how students perceive the written communication of their classmates and how they determine the degree of appropriateness of others students' posts. The results of this study help to shed light on this important topic.

With a better awareness of student perceptions of classmates in online contexts, instructors are in a better position to provide guidance and feedback to students to promote effective student learning of academic content as well as the development of appropriate interpersonal effectiveness skills. For example, instructors could provide concrete examples of appropriate and inappropriate disclosure in discussion responses. Without a clear understanding of boundaries in a classroom, some students are likely to engage in behaviors that cross these boundaries. It is also important for instructors to model appropriate disclosure behavior for their students. Instructors need to take into account the different communication styles of students. Curriculum designers could create discussion prompts that are not overly personal in nature and that would not be as likely to evoke inappropriate disclosure from students. For discussion prompts that are personal in nature, instructions should explicitly state that responses must be relevant to the question.

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Editor's Note: The regional university of the island nations of the South Pacific provides unique challenges for teaching and learning that can gain substantial value from media, especially interactive multimedia and computer simulations.

Blending media for flexible learning at a regional university

Javed Yusuf, Deepak Prasad, Dhiraj Bhartu
Fiji

Abstract

The University of the South Pacific (USP) a regional university, established in 1968, serves twelve independent island nations of the South, Central and North Pacific. The University is moving towards providing more of its programmes and courses through flexible delivery using online and blended modes. As a result there has been a gradual increase in the integration of multimedia components such as audio, video, graphics, animations, and simulations as part of courseware or course packages. This increase in demand is anticipated to have further growth.

This paper focuses on the current status on the different types of multimedia currently integrated in USP coursewares, and discusses the areas of multimedia that is anticipated to grow over the next few years at USP.

Keywords: multimedia, online and blended courses, coursewares, videos, interactive media, games.

Introduction

In today's digital age, educators around the globe are demanding far more cost-effective, engaging and social learning practices in education. Higher education institutions have over the last decade adopted multimedia technologies and multimedia content to facilitate these practices and enhance the delivery of learning and teaching experiences. Multimedia offers instructors a myriad of delivery possibilities with different types of media, flexibility, diverse learning styles, and personalisation in learning, leading to enhancement and effectiveness of learning and teaching experiences.

The University of the South Pacific (USP) is no different, being a pioneer in the use of technology in education in the South Pacific region. The University, in its bid to transform itself, has undertaken a large-scale conversion of USP courses for flexible delivery, thus moving towards providing more of its programmes and courses using online and blended modes. Hence, the need for multimedia in the delivery of learning and teaching experiences in USP's online and blended modes. The Multimedia Team is a dedicated section within the University's Centre for Flexible Learning, tasked with the development of multimedia.

This paper focuses on the current status on the different types of multimedia currently integrated in USP coursewares, and discusses the areas of multimedia that is anticipated to grow over the next few years at USP. It draws heavily on the literature to rationalise these.

Literature review

"Literally, multimedia is the integration of two or more communications media. It is the use of text and sounds, plus still and moving pictures to convey ideas...it is built around the premise that anything words can do, words with sounds and pictures can do better" (Kalmbach, 1994, p. 29). Reddi (2003) defines multimedia as an "integration of multiple media elements (audio, video, graphics, text, animation, etc.) into one synergetic and symbiotic whole", while Lau, Yen, Li and

Wah (2013) broadly described as the use of various types of media and communication technologies to enhance content visualization and user interaction.

In education, particularly in the delivery of learning and teaching experiences, multimedia can be used to supplement course content and activities in innovative or interactive ways (McFarland, 1996), and research in educational psychology suggests that "learning is affected positively by presenting text and illustrations together" (Mayer & Sims, 1994, pp. 389-401). Research has also demonstrated that the use of multimedia, either alone or in conjunction with other instructional supports, as effective for promoting knowledge (Gormley & Ruhl, 2007; Kennedy et al., 2013; Thomas & Rieth, 2011).

Montegomery (1995) submitted that the use of multimedia enhanced learning by learners with different learning styles. He also viewed that multimedia fill in the gaps created by dichotomy in teaching and learning styles. Furthermore, Chun-hui and Fu (2015) highlights that multimedia can increase the sensory stimuli of learners by the integration of sound, image, text, and animation, and making the teaching and learning process become figurative, three-dimensional, and vivid, thus, improving learners' interest, attention, and learning efficiency.

Recent surveys such as the 2013 Speak Up survey by Evans (2013) as cited in Reidel (2014), highlights some of the key emerging trends in educational media technology being: (a) increase number of the learners having access to mobile devices with 3G or 4G enabled internet connectivity, and using it transform their own learning processes, (b) the rise in the use of video as a learning and teaching tool by both instructors and learners, (c) growth in learner gaming, particularly its application in the learning processes, and (d) increase in learner expectations of using social media (Facebook, Twitter, Instagram, etc.) as pervasive learning tool.

The use of multimedia in learning can help to promote deeper meaningful learning and has positive impact in creating a learner-centered educational environment (Li, 2016). Several studies (such as Demirer & Sahin, 2012; Low, Low & Koo, 2003; Mackay & Ho, 2008)) highlight that the use of multimedia in learning is considered to be effective in the transformation process from traditional approach of face-to-face delivery of learning and teaching experiences to blended and also to online learning approaches. The integration of multimedia and multimedia technologies has become a core part in the design, development and delivery of e-learning, online learning or blended learning courses. Lau et al. (2013) categorized these into multimedia that bring substantial changes to learner learning processes (such as communication technologies, social networks and games as a medium of e-learning) and content that improves learner learning effectiveness and experience (such as text, audio, images, animation and video). This paper focuses on the latter; multimedia content.

Context

The University of the South Pacific (USP) a regional university, established in 1968, initially in face-to-face mode, is now a multi-mode institution (print-based distance education started in 1971 and online in 2000). It serves twelve independent island nations of the South, Central and North Pacific of the Pacific (Cook Is., Fiji, Kiribati, Marshall Is., Nauru, Niue, Solomon Is., Tokelau, Tonga, Tuvalu, Vanuatu and Samoa) with 14 regional campuses around the Pacific. The main campus is located in Suva, Fiji. USP is the only regional university of its type in the world with regionalism in the core components of its organisational structure: financial, physical, academic, and political as the twelve Pacific island nations which, as proprietors, exercise collective governance. The USP member island nations are geographically dispersed, culturally, linguistically and economically diverse, spanning across 33 million square kilometers and four time zones.

The total population within this area is less than 1.5 million and is situated in countries which range from groups of small coral atolls, to one island countries and volcanic groups of islands and

within its four major ethnic groups, Melanesian, Micronesian, Polynesian and Indian, there are 265 distinct languages and 60 distinct cultures prevalent. Many island communities are rural, remote and sparsely populated with traditional societies blending the indigenous cultural norms with forces of modernisation and development. USP offers more than 400 courses per semester through four modes; face-to-face, print, online and blended. The University, in its bid to transform itself, has undertaken a large-scale conversion of USP courses for flexible delivery (The University of the South Pacific, 2012). Thus USP is moving towards providing more of its programmes and courses using online and blended modes.

Reporting to USP's Deputy Vice-Chancellor (Learning, Teaching and Learner Services), the Centre for Flexible Learning (CFL) is a support section tasked to lead the enhancement of quality in all aspects of Flexible Learning (FL) design and development at USP. Specifically the role of CFL is to: (a) leverage technology and integrate new pedagogies for designing and developing all USP programmes in Flexible and Online modes that exemplify excellence in knowledge creation, and (b) develop collaboratively with faculties, campuses and regional agencies, high quality and innovative learning courses and programmes for the region in formal, continuing and community education. The Centre has three other sub sections/teams: Learning Design & Development, Learning Systems and the Multimedia Team, each having specific roles and duties.

The Multimedia Team

The Multimedia Team (MMT) is a section of the Centre for Flexible Learning (CFL) offering a wide range of services in quality, creative and innovative educational media technology, including services in audio, video, graphics, photography, animation, interactive multimedia, web design, electronic publishing and digitization.

Some of MMT's audio video services include: (a) audio video production for online and blended delivery, (b) professional screen-casting, synching presentations with voice-overs, (c) live lecture recordings and guest lecture recordings (in-Studio, and on-Location), (d) production of promotional and documentary videos, and (d) production of instructional and training audio video. MMT services also include the development of interactive web content and animations, or interactive media combining the elements of audio, video, graphics and animations, such as interactive infographics, animated videos, interactive learning simulations and HTML5 applications. MMT also offers professional graphic design, layout, illustration, digital photography, and electronic publishing services. MMT works with the Learning Design and Development section of CFL and individual instructors to produce multimedia content for flexible (online or blended) courses.

The last four years - Multimedia in USP coursewares

MMT works with the Learning Design and Development section of CFL and the respective instructors (content specialist) to produce multimedia content for flexible (online or blended) courses. Some of the most common forms of media content the MMT has produced over the last 4 years for online and blended courses are:

- **Voice-over PowerPoint videos and Screencasting:** This is basically the synchronisation of a instructor's voice, narration or audio recordings with the accompanying PowerPoint slides produced into a video, and uploaded on the learning management system thus providing learners access to an entire traditional face-to-face classroom lecture experience online. These videos might be an entire lecture or just short lecture bites; and sometimes summarising key points of a topic or lecture. Another form of this is screencasting; the digital recording of action on the computer screen (including cursor movements and mouse clicks), not necessarily PowerPoint presentation, synced with voiceover narration, all combined into a single video.

- **Talking head style videos:** The 'talking head' style videos are where the instructors is delivering a lecture, usually pre-recorded in a studio environment. This can vary from the delivery of an entire lecture to just short lecture bites; sometimes summarising key points of a topic or lecture, or talking heads combined with cutaways of PowerPoint slides.
- **Course audio or podcast:** The 'course audio' or podcast involves pre-recording lecture audio usually recorded in a Studio environment. The recorded audio is then uploaded on the learning management system as a part a courseware for a respective course. This can vary from the pre-recording delivery of an entire lecture, to short lecture bites; sometimes summarising key points of a topic or lecture.
- **Interactive simulations:** These are animated, interactive, and game-like environments or activities in which learners learn through exploration usually by interacting with the environment or activity.
- **Course banners (mastheads), graphics, illustrations and icons:** These include graphic designing of customised course banners or mastheads and graphics, illustrations and icons to support course concepts.

The MMT keeps a portfolio of multimedia work undertaken by the team. The following data was retrieved from the portfolio of work over the last 4 years (2012-2015). It provides data on the number of different types of multimedia produced for online and blended courses at USP. The data presented below reflects the work undertaken by MMT; however, there are other multimedia used for online and blended courses at USP that are not produced by MMT.

Table 1
Volume and types of multimedia developed by MMT from 2012-2015 for USP coursewares

Multimedia type	Year			
	2012	*2013*	*2014*	*2015*
Voice Over PPT (screencasting)	3	4	18	27
Live Lecture Video Recording	1	0	2	5
Talking heads videos	0	10	10	11
Field Work Video Recording	0	3	0	3
Course audio (podcasts)	17	13	11	8
Online graphics (banners, illustrations, icons)	6	8	5	9
Interactive simulations	0	0	7	4

The next few years - Multimedia in USP coursewares

The multimedia content developed by the MMT at USP (data presented on Table 1) will continue to grow over the next few years. However, two particular multimedia types are anticipated to have significant growth in terms of scale, volume and application to learning and teaching. These are videos and interactive multimedia.

Videos on demand

Several recent studies (such as Hsin & Cigas, 2013; Kay, 2012; Moore & Smith, 2012) have shown that videos, particularly, can be a highly effective tool for the delivery of learning and teaching experiences. The advances and easement in video recording technology and growing enthusiasm for the "flipped classroom" model have seen increased momentum on the use of pre-

recorded lecture videos as learning and teaching strategy across the education sector (Pardo et al., 2015). More instructors have and will start to utilize some form of videos in their courses, as technology is enabling the understanding, creation and usage of videos in the delivery of education, relatively easy. The massive growth of video sharing sites such as YouTube and Vimeo, popularization of Khan Academy's short instructional videos and university-specific equivalents, assisting even those non tech-savvy or digitally immigrant instructors to make use of videos easy for their delivery of instructions.

Over the next few years, there will be an increase in the development and use of videos in in the delivery of blended and online courses at USP, either as a direct replacement for fully online courses or for blended courses, to supplement traditional face-to-face delivery of learning and teaching experiences. There are few reasons why the videos will be on rise in USP coursewares:

(a) USP's push for large-scale conversion of USP courses for flexible delivery of its programmes; courses using online and blended modes will require inclusion of some form of videos;

(b) This "push" from USP will see the use of flipped classroom models of delivery of learning and teaching; lecture or class videos will be pre-recorded and distributed to learners. Actual face-to-face time will be utilized for classroom and tutorial discussions; a far more engaging and effective contrast to traditional lecture delivery during face-to-face time;

(c) Increasing internet bandwidth and connectivity within USP's campuses and as well as by other internet service providers in the region; increasing number of learners having access to high speed internet enabled smart phones will lead to greater demands for videos for delivery of learning and teaching experiences; (d) USP's increasing efforts and commitment to providing an accessible and inclusive learning\, will lead to more development of multimedia (for e.g. videos) as it is effective for learners with different learning styles (Montegomery, 1995).

With these rationales, the areas of videos that are anticipated to be of more demand and on the rise within the USP coursewares are discussed below.

From the data given above on (Table 1), it can be anticipated that over the next few years, there will be a rapid increase in the development of voice over PowerPoint style videos and screencasting. Several studies also showed that learners generally perceive this style of videos beneficial (Evans, 2011; Falconer et al., 2009, Harpp et al., 2009). More recently, a study by Winterbottom (2015) concluded that learners overwhelmingly favoured delivery of instructors using the screencasting or voice over PowerPoint compared to traditional delivery of lectures, noting learners were able to learn more, take better notes, and gain a better understanding of the lecture material using this method of delivery.

The development of 'talking head' style videos is also anticipated to grow in the next few years as per the data given on (Table 1). However, it is envisaged that the 'talking head' style video may take a different form, possibly moving more towards the popular Khan Academy styled or MOOC styled videos which would include video of instructors drawing freehand on a digital tablet or smart boards. These videos will be short, optimally between five to ten minutes in duration, and succinct in nature. Guo, Kim and Rubin (2014) noted that this style of video allows instructors to situate themselves on the same level as the learner offering more learner engagement rather than talking at the learners in instructor's mode. Davis (2012) also highlighted the short duration of this style of video enables reinforcement of key learning concepts, promoting mastery learning, which has advantages over traditional lecture-based learning.

Online video annotation is another area that is anticipated to see some traction over the next few years in USP coursewares, although this will be not from video production/development end, but

more from the learner end. Advancements in video technologies have afforded opportunities for learners to annotate videos by adding comments, notes, links, hotspots, and sharing it with peers and instructors, which in turn helps in "searching, highlighting, analysing, retrieving, and providing feedback, without modifying the resource itself" (Khurana & Chandak, 2013). Video annotation offers the potential for learners to reflect, analyse and connect to curriculum content (Lemon, et al., 2013). Although there has not been any real work done on the use of online video annotation in any of the existing USP coursewares, initial research has begun which could be followed by pilot projects.

Video captioning or subtitling is the process of converting the audio content of a video into text, synchronising and displaying the converted audio text during the playing of the video. Together with displaying words as the textual equivalent of spoken voice, video captions can also include speaker identification, sound effects, and music description and are commonly produced or incorporated during the video production and recording stage. Captioning makes videos more accessible and inclusive, especially for hearing impaired learners who can obtain the necessary information from texts. It also assists in the comprehension of a video for those learners who have difficulty in understanding the accent and the speed of spoken word by different speakers in a video. Studies (such as Gulliver & Ghinea, 2003; Yoon & Choi, 2010) demonstrate that video with captions leads to the highest levels of comprehension. Currently at USP, few videos produced by MMT for USP coursewares have video captions; they are done mainly on a request basis by the instructors. However, captioning of videos is anticipated to be on the rise over the next few years at USP. This will be accomplished during the development/production phase of videos by MMT. This increase will also be because of USP's increasing effort, commitment and mobilisation resources to providing an accessible and inclusive learning and environment and to implement the University's legal obligation to provide an environment free from human rights discrimination, as articulated in the USP Disability Inclusiveness Policy (2013).

Interactive multimedia rises

Interactive multimedia is the combination of text, pictures, audio, video and animation organized a cohesive system which empowers the learner to interact and control the environment (Philips, 2014), and these include simulations, games and virtual and augmented reality. They can be used to deliver learning and teaching experiences where learning materials are difficult to visualise (such as three-dimensional). They cover broad and complex ideas and contexts and are simulated as real-life scenarios (such as robotics). Interactive multimedia can have positive effects on learning and facilitate deep learning by actively engaging the learner in the learning process (Evans & Gibbons, 2007). Interactive multimedia can address several learning styles and modalities, and elicit the highest rate of information retention and results and reduce learning time (Neo & Neo, 2001). Interactive multimedia (such as decision tree simulations, video simulations, and animations) enables learners to learn-by-viewing, learn-by-doing, or learn-by-coaching (Mishra & Sharma, 2005).

Over the next few years, it is anticipated that there will be an increase in the development and use of interactive media, particularly, learning simulations and games, in the delivery of blended and online courses at USP. These will be used to support a learning activity either as a direct replacement (for fully online courses) or to supplement (for blended courses) the traditional face-to-face delivery of learning and teaching experiences. There are few reasons why the interactive multimedia will be on rise in USP coursewares:

(a) USP's push for large-scale conversion of USP courses for flexible delivery of its programmes, and courses using online and blended modes, will require some form of interactive multimedia to simulate real world and classroom experiences.

(b) Increasing internet bandwidth and connectivity within USP's campuses and as well as by other internet service providers in the region; increasing number of learners having access to high speed internet enabled smart phones. This will lead to greater and faster access to interactive multimedia applications. With these rationales, two areas of interactive multimedia are anticipated to be of more demand and on the rise within the USP coursewares over the next few years – interactive learning simulations and multimedia games. They are discussed below.

Interactive learning simulations are instructional products that combine simulation, pedagogy, and social learning situated within real-life contexts and scenarios creating a truly engaging, meaningful and behaviour-changing form of learning and are used to help learners better understand complex concepts and processes that is entirely driven by their experiences within the environment (Beckem & Watkins, 2012).The development and use of interactive learning simulations is anticipated to grow in the next few years at USP. Offering a "safe environment", interactive learning simulations can allow learners to practice skills that otherwise could be dangerous to practice in the real life situations (Merchant et. al.2014).

The data presented in Table 1 reflects the infancy stage of the use of interactive media in USP coursewares, as this is a relatively new area for USP and the MMT. However, this is anticipated to grow with Science disciplines (Physics, Chemistry, Biology, Geosciences) predicated to be the early adopters of the use of interactive learning simulations due to its affordances in providing cost-effective practice of procedures using virtual apparatus that in real life could be cost prohibitive; and for providing "lab" experiences to learners of blended and online courses without the need for physical geographic presence.

Games (also referred to as computer or video games) are interactive multimedia environments set within a competing or challenging context, include story lines with specific objectives to be achieved and conducted with specific rules of participation (Tobias & Fletcher, 2012). Games stimulate learners and provide them with opportunity to play an active role in their own learning (Ghanbaran & Ketabi, 2014). Multiple studies have shown that games have positive effect on learner achievement, interest, task learning, engagement and problem solving (Kim, Park, & Baek, 2009; Robertson & Howell, 2008; Tuzun et al., 2009; Wideman, et al. 2007).

The development and use of multimedia games in the USP coursewares are anticipated to grow over the next few years. Currently, basic games such as interactive puzzles and treasure hunt searches have been developed by MMT for USP coursewares. The games will be used as a learning task or activity set to achieve a learning outcome, or as experimentation task to try out alternative courses of action and experience a range of different outcomes or to reinforce a learning concept. Moreover, it is also anticipated (at a very limited and basic scale), that games will be combined together with augmented reality (similar to Pokemon Go and Blippar apps) and will be used in USP coursewares such as for courses in geo-location, history, climate change and environmental sciences.

Conclusion

There are several benefits and possibilities with the use of multimedia in the delivery of learning and teaching experiences, especially more for online and blended courses. Its development and application in enhancing delivery of learning and teaching experiences would become inevitable and more widespread, as the University of the South Pacific progresses towards offering more of its programmes and courses on online and blended modes. Current types of multimedia content being developed by MMT will increase and it is anticipated that over the next few years videos (such as voice over PowerPoint, screencasting, talking heads, video annotation, captioning) and interactive multimedia (such as simulations and games) will be on the rise in USP coursewares.

Future work should focus on the efficacy of multimedia content developed by MMT on the learner achievements and enhancement of learner experiences.

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