Incorporating Online Interactive Educational Activities in Animal Science Courses[1]

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Abstract

The use of technology inside the classroom is continuously growing and options for learning platforms are increasing. University of Nebraska-Lincoln undergraduate students enrolled in four different Animal Science courses had the opportunity to utilize online interactive activities developed through a software program called SoftChalk. The activities were developed as an additional resource for students to use as a review method on key course concepts. At the completion of the semester, the students were asked to complete a survey on the usefulness of the SoftChalk activities. The survey also assessed the student's overall opinion and perceived effect that activities had on their learning experience. Students (82.68%; n=149) indicated SoftChalk activities helped them retain course material longer. While 85.94% of students noted the activities helped them feel more prepared for the exams and quizzes, only 61.72% of students felt that by completing these activities they had improved their critical thinking skills. Students (83.59%) acknowledged the review activities positively impacted their grade in the course. These interactive learning activities allowed for reevaluation of course material presented in a distinctive way.

Key words: interactive activities, animal science, education, softchalk

Introduction

As online technology continues to grow, so do the possibilities for use of technology in the classroom. Faculty are steadily gaining more interest in exploring different ways to make learning more engaging and enjoyable for students (Maiga and Bauer, 2013). Many online resources are being used to assist in the enhancement of the students' learning, such as course Facebook groups, Google Docs, Khan Academy and other online tools.

Using activities and games in class encourages active learning, as well as collaboration, and interactivity (Ruben, 1999). Therefore, by using different types of blended learning resources we are increasing the students chance to understand the content being presented. Maiga and Bauer (2013) found while interactive activities and games can be incorporated into almost any type of course, having it incorporated in courses with increased volume of information present, such as Animal Science courses, can assist the student in processing information in a more meaningful manner.

The objective of this study was to create online interactive course review activities, through an online curriculum development program (SoftChalk LLC, www.softchalk.com), that were beneficial to the student's learning. SoftChalk is a content building tool that allows instructors to incorporate multiple interactive resources, develop custom design templates, and organize content information into one location. The materials can be shared across multiple learning management systems (About SoftChalkTM Cloud, 2015).

Additional objectives of this study were to determine if the students found the activities beneficial to their learning experience, if the students found the activities played a beneficial role on their grade and if they were able to better comprehend the key concepts in the course as a result of the online interactive activities.

Methods

Course Enrollment

The study included four Animal Science courses at the University of Nebraska-Lincoln during the fall semester of 2014. A core course all Animal Science students are required to take and three species specific courses that were content driven were chosen for the study. The courses involved were ASCI 240: Anatomy and Physiology of Domestic Animals (core course, 59 students enrolled), ASCI 251: Introduction to Companion Animals (51 students enrolled), ASCI 252: Introduction to the Horse Industry and Management (29

students enrolled), and ASCI 450: Horse Management (20 students enrolled). The four courses were offered in an on campus traditional face-to-face lecture format and lasted one semester over a total of sixteen weeks.
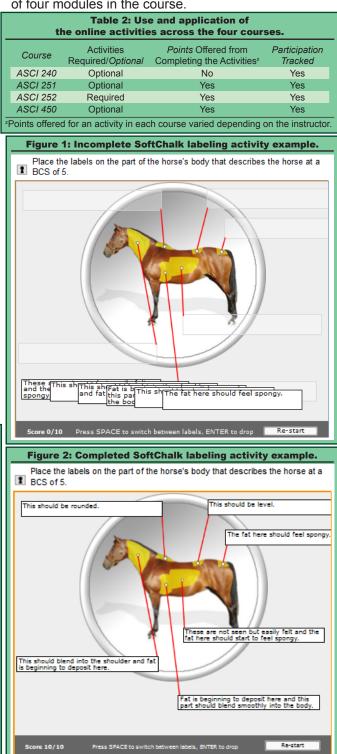
Activity Conditions

A variety of activities were created through the e-learning content creator SoftChalk. SoftChalk was used in the courses to incorporate online interactive activities as a resource to assist in student's perceptions of comprehension and retention of key course concepts. Examples of interactive activities used were crossword puzzles, photo albums, sorting, DragNDrop, flashcards, hotspot, labeling, quiz popper, and tabbed info (Table 1). One example of an activity would be the labeling activity (Figure 1 and Figure 2). This activity will usually contain an image which has labels that can be matched to their corresponding location on the image. While the types of activities were chosen by the instructor, not all the types of activities were used in all four courses of this study. Activities were accessible to the students through the university's course content management system, Blackboard. The activities included a set number of points, determined by each instructor, to be earned and linked to the gradebook in Blackboard. A tracking tool in SoftChalk enabled instructors to view the highest scoring grade for each student, most recent score, how many attempts each student made on the activity and the date they completed the activity. The students were allowed to participate in the activity with an unlimited number of attempts.

During the study, each course used different conditions to add online interactive activities in their courses (Table 2). Three of the four courses made the SoftChalk lessons optional. The course that made the activities a requirement (ASCI 252) and two of the courses that made it optional (ASCI 251 and ASCI 450) offered

course points if the activities were completed. The activities were optional in ASCI 240 and recommended as an additional study resource for students. Each of the course instructors chose to use activities in different portions of their course during the semester: ASCI 240 used a total of 16 activities throughout the entire semester, ASCI 450 used a total of 16 activities in the second, third and fourth modules out of four modules in the course, ASCI 252 used 9 activities in the first and second modules out of four modules in the course, and ASCI 251 used a total of 7 activities in the second module out of four modules in the course.

Table 2: Use and application of the online activities across the four courses.

Course	Activities Required/Optional	Points Offered from Completing the Activities[z]	Participation Tracked
ASCI 240	Optional	No	Yes
ASCI 251	Optional	Yes	Yes
ASCI 252	Required	Yes	Yes
ASCI 450	Optional	Yes	Yes

[z]Points offered for an activity in each course varied depending on the instructor.

Figure 1: Incomplete SoftChalk labeling activity example.

Figure 2: Completed SoftChalk labeling activity example.

Table 1: Descriptions of SoftChalk activities.

Activity	Description
Crossword puzzles	A word puzzle containing clues to the words which belong as the correct answer to the puzzle
Photo albums	Contains a series of images with descriptions of the image
Sorting	Contains a maximum of five sorting groups and cards that can contain information or an image to match to that specific sorting group
DragNDrop	Can consist of eight matching pairs where the student will drag the correct item to its matching pair
Flashcards	Can consist of a series of cards that can contain a term, definition and image on the card which students can use to quiz themselves
Hotspot	An image that have information over certain areas of the image which students can use to learn more information about that image or can be quizzed over the image
Labeling	Contains an image which has labels that can be matched to their corresponding location on the image
Quiz popper	Contains up to seven different types of quiz questions such as: true/false, multiple choice, multiple answer, short answer, matching ordering, and essay. This activity allowed students to answer practice test questions over the newly learned information
Tabbed info.	Contains tabs of up to eight pages of information which can contain text and image to go along with the particular information on the tab.

Activity Evaluation

An optional survey was developed to be completed by undergraduate students enrolled in the participating classes at the end of the semester. While there was a total of 13 students of the 159 in the study that were enrolled in two of the four classes concurrently, the activities were often different between courses which allowed for the students to have the opportunity to take the survey more than once. The survey was designed with the objective to obtain feedback from the undergraduate students on how useful they found each of the online interactive SoftChalk activities. Students were first asked if they participated in the SoftChalk activities. If the students answered that they did participate, they were then asked how useful and/or how much they used the various types of activities. This survey was considered an evaluation of a course tool by the University of Nebraska-Lincoln Institutional Review Board.

Students were asked to respond based on the five point Likert-type scale (5 = Very Useful/Used Extensively, 4 = Fairly useful, 3 = Moderately Useful/Moderately Used, 2 = Somewhat Useful, 1 = Minimally Useful/Minimally Used, 0 = Not Useful/Not Used) on how useful or how much they used the various type of SoftChalk activities. The survey also included general questions about the class to determine if students felt well prepared for the exams, if they understood the key concepts, if they were able to keep up with the course material, and if they felt that no additional study materials were needed for the course after completing the SoftChalk activities. The survey was provided to students during the last week of classes to serve as an evaluation of the activities.

Statistical Analysis

The data was analyzed using the frequency procedure of SAS to determine the overall frequency of responses to each question by course. The survey was analyzed using the courses as the fixed variable. The data obtained from the survey was combined for all classes to provide a larger sample size that represented a larger population

Results and Discussion

The four animal science courses involved in the study had a total of 159 students enrolled and 138 of the 159 students (86.8%) responded to the survey. The data from the surveys were combined as the frequency data was similar by

course. Of those responding, 128 (92.8%) stated that they participated in the SoftChalk activities (Table 3).

Though not all of the activities were used in all courses, of the nine different types (labeling, sorting, DragNDrop, flash card, crossword puzzle, quiz groups, photo album, tabbed info., and hotspot), students reported three were most useful. The three activities used most extensively were sorting (86.6%; sorting a card containing information to the correct corresponding category card), labeling (87.9%; image which the student would need to match the corresponding label to the correct location on the image), and DragNDrop activities (81.75%; list of up to seven boxes of information and seven boxes of corresponding information that they would have to match up with the original seven boxes; Table 4).

The survey evaluated items such as how many times students completed each activity, student preference for the number of activities per module, and how much time it took them to complete an exercise. Most students indicated they completed an activity two to three times (66.9%; n=127). Over half of the students (55.2%; n=125) preferred to have four to six review activities per learning module. Students (70.9%; n=127) also reported activities took five to ten minutes to complete. Providing the students the opportunity to practice these lessons more than once can link the distance between learning the course concepts to actually applying the concepts in a setting outside of the classroom (Kumar and Lightner, 2007). This is a possible explanation for why students preferred to have four to six items per module instead of one to three per module. Additional resources allowed the students extra review of concepts presented and provided increased opportunities to apply the concepts, rather than just learning about them.

When asked if they felt the SoftChalk activities positively impacted their grade in the course, 83.6% (n=128) agreed it had (Table 5). Maiga and Bauer (2013) reported similar results in that the students felt interactive games helped improve exam scores. In the current

Table 3: Student enrollment and SoftChalk usage for courses integrating SoftChalk into class material.

Item	Course			
	ASCI 240	ASCI 251	ASCI 252	ASCI 450
Total students enrolled in the course (n=159)	59	51	29	20
Respondents to survey (n=138)	45	45	28	20
Respondents that stated they used the SoftChalk activities provided (n=128)	44 (97.8%)	39 (86.7%)	27 (96.4%)	18 (90.0%)

Table 4: Student rankings of the usefulness of different types of interactive SoftChalk activities.

Activity[z]	Very Useful/ Extensively Used	Fairly Useful	Moderately Useful/ Moderately Used	Somewhat Useful	Minimally Useful/ Minimally Used	Not Useful/ Not Used
Labeling (n=116)	74 (63.79%)	28 (24.14%)	7 (6.03%)	2 (1.72%)	0 (0%)	5 (4.13%)
Sorting (n=127)	72 (56.69%)	38 (29.92%)	7 (5.51%)	6 (4.72%)	1 (.79%)	3 (2.36%)
DragNDrop (n=126)	77 (61.11%)	26 (20.63%)	10 (7.94%)	5 (3.97%)	2 (1.59%)	6 (4.76%)
Flash Card (n=125)	51 (40.8%)	35 (28.0%)	24 (19.2%)	7 (5.6%)	3 (2.4%)	5 (4.0%)
Crossword Puzzle (n=128)	53 (41.41%)	27 (21.09%)	17 (13.28%)	10 (7.81%)	8 (6.25%)	13 (10.16%)
Quiz Groups (n=112)	42 (37.5%)	25 (22.32%)	16 (14.29%)	3 (2.69%)	3 (2.69%)	23 (20.54%)
Photo Album (n=112)	27 (24.11%)	26 (23.21%)	29 (25.89%)	11 (9.82%)	6 (5.36%)	13 (11.61%)
Tabbed Info. (n=112)	21 (18.75%)	30 (26.79%)	26 (23.21%)	7 (6.25%)	7 (6.25%)	21 (18.75%)
Hot Spot (n=114)	23 (20.18%)	25 (21.93%)	24 (21.05%)	11 (9.65%)	7 (6.14%)	24 (21.05%)

[z]n varies between items based on number of responses to each individual question.

Table 5: Student perceptions of participation in the online interactive SoftChalk activities.					
Item Statement[z]	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
I felt that the SoftChalk activities positively impacted my grade in the course. (n=128)	49 (38.28%)	58 (45.31%)	18 (14.06%)	2 (1.56%)	1 (0.78%)
The SoftChalk activities were not helpful towards my learning and were just busy work. (n=128)	1 (0.78%)	7 (5.47%)	7 (5.47%)	67 (52.34%)	46 (35.94%)
The SoftChalk activities helped me retain course material longer. (n=127)	41 (32.28%)	64 (50.39%)	19 (14.96%)	3 (2.36%)	0 (0%)
The SoftChalk activities helped me feel more prepared for the exams and quizzes. (n=128)	52 (40.63%)	58 (45.31%)	10 (7.81%)	6 (4.69%)	2 (1.56%)
I used the SoftChalk activities to help review for an exam/quiz. (n=128)	64 (50.0%)	48 (37.5%)	12 (9.38%)	4 (3.13%)	0 (0%)
I was better prepared for the exam and lessons with SoftChalk activities than those without SoftChalk activities.(n=128)	48 (37.5%)	54 (42.91%)	18 (14.06%)	6 (4.69%)	2 (1.56%)
Completing these activities improved my critical thinking skills. (n=128)	26 (20.31%)	53 (41.41%)	33 (25.78%)	13 (10.16%)	3 (2.34%)
[z]Ranked on a scale of 1-5: 1= Strongly Disagree, 2= Disagree, 3= Neither Agree or Disagree, 4= Agree, 5= Strongly Agree					

study, the activities made the students feel more prepared for exams and quizzes (85.9%; n=128).

Almost 90% (n=128) of students strongly disagreed or disagreed when asked if they felt that the SoftChalk activities were not helpful towards their learning and were just busy work. A few of the comments made by the students included "it was a fun", "interactive way to study and learn", "it truly tested our knowledge rather than just reading the notes", and "it was a valuable resource". These statements indicate an apparent benefit of the activities to students' learning experience.

Over 82% (n=127) of students claimed the online activities helped them retain the course material longer and this allowed students to better comprehend key concepts in the course. Our finding was similar to those of Randel et al. (1992). Since these types of games require active participation, the material has a greater chance of being integrated into the cognitive structures for the student and, therefore, more likely to be retained. Interactive games and activities have been shown to motivate people to learn, even those who might not have been interested in the material (Reigeluth and Squire, 1998; Lepper and Henderlong, 2006; Liberman and Linn, 1991). This explains why over 87% (n=128) of students indicated that they used the activities as a method to review material for upcoming quizzes and exams.

When asked what they liked most about the exercises, several students stated that the activities challenged their knowledge and allowed for increased comprehension of the concepts. The activities required thought, improved retention of information, required minimal time and helped summarize material in preparation for exams.

Student recommendations for improvement to the activities included providing clear instructions initially on how to use the activities, making all of the activities mandatory and point earning, having all activities engaging and not just informational, correcting some of the technical issues such as making it more mobile-friendly, and developing more of the activities for the entire course. Students suggested the instructor should provide a printed key and include the expectations for the use of the activities in the syllabus and within each activity.

A few possible explanations for some of the drawbacks in the findings of this study include the likely dif-

ference in instructor teaching styles and development of lessons. Each instructor chose the type of activity, quantity, and requirements to their own personal preference for their specific course. Bourgonjon et al. (2010) found that it is more beneficial to the students' learning to explain to the students the specific advantages the particular activity or game has over other teaching tools rather than to present it as a fun way to learn. Therefore, by explaining the advantages of the SoftChalk lessons and creating a more unified environment across courses, this study may have been able to achieve a more valuable set of results. The study was also only completed over a length of sixteen weeks. Therefore, additional studies would be beneficial to support findings.

Because a variety of Animal Science courses were involved in the study (three sophomore/junior level courses and a senior level course), a variety of knowledge and degree of difficulty was incorporated into the activities. Students were provided with a unique online interactive learning resource for Animal Science courses. Furthermore, using new and different types of technology will help prepare students for future careers where familiarity with current technology will become even more important (Rhoades et al. 2008).

Summary
Numerous activities were developed in SoftChalk, made available online to students in four Animal Science courses and evaluated through a student survey. The online activities allowed for students to engage in a non-traditional study method. The students found that the exercises helped them better understand the course material and feel prepared for quizzes and exams. In addition, students indicated the activities played a beneficial role in their grade and to their learning experience. In conclusion, online SoftChalk interactive review tools included in the courses provided students with additional learning resources and students confirmed that the activities enhanced learning of course content. The use of online interactive review activities can be beneficial in preparing students and helping them to learn and retain the course information.

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