Greek-Roman Mythology Redefined: Perceived Usefulness of a Cognitive Tool in an Undergraduate Online Course

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Abstract

ThinkSpace, a cognitive tool with the underlying premise that people learn by creating explanations for any given system, was implemented in redefining an asynchronous online Greek and Roman Mythology undergraduate course. This paper elucidates the re-design of interpretive writing assessments as multi-step cases, the affordances of the tool, and students' perceived usefulness of using ThinkSpace in learning the course content.

Introduction

One of the critical aspects of learning is problem solving. According to Gagne "the central point of education is to teach people to think, to use their rational powers, to become better problem solvers" (Gagne,1980). One way of achieving such learning is by the use of cognitive tools that promote active-learning or learning-by-doing (Kozma,1987; Ebner & Holzinger, 2007). Thinkspace is one such cognitive tool that facilitates a scaffolded process of interpreting large amount of information based on comprehension of underlying concepts and rules. It was initially called the Diagnostic Pathfinder and was built in 2007 by researchers from a large land-grant Mid-Western University. It was implemented to teach diagnostic problem solving to veterinarian students. It has since evolved with additional tools and is widely used across disciplines such as Communication, Engineering, Geology, Classical Studies and others (Bender & Danielson, 2011; Danielson, Mills, Vermeer, & Bender, 2008; Danielson 1999).

This paper describes the use of, Thinkspace, to redesign the interpretive writing assignments in an eight-week asynchronous online course in Greek and Roman Mythology, that was first offered in Summer 2016 and thereafter in Summer 2017. It also shares the student perceptions of usefulness of using such a tool in the course along with the instructor perspectives on Thinkspace and the design and development of the course.

The development of the course was funded by a grant from the online learning unit, within the Colleges of Engineering (COE) and Liberal Arts and Sciences (LAS) at a large Midwestern university. The instructor collaborated with an instructional designer (ID) as part of the grant. The main role of the ID was to provide pedagogical, technical, and instructional assistance. The development process followed an adapted ADDIE model in combination with Backward Design (Grant and Wiggins, 2005).

Course Background

This Greek and Roman mythology undergraduate course introduces learners to various myths and theories of the classical world, gods and goddesses and their relation to religious, psychological, social practices. Courses on mythology in general, and on Greek and Roman mythology specifically, are common. Though such a wide distribution naturally produces great diversity in specific content covered and the approaches taken to that content, a glance at the most commonly used mythology textbooks (Morford-Lenardon, Powell) suggests that the organization of such courses is consistently content-based and content-driven. The various major stories of Greek and Roman mythology are treated as a body of "fact," which students are expected to master. That mastery is then demonstrated by means of objective assessments - multiple choice and short answer questions on events and characters in the story

- with some more subjective assessments mixed in to touch on overarching themes. As mentioned, this orientation is reflected in the organization of the major textbooks, which consists of chapters focused on particular characters and/or stories. In each offering, though the specific sources and sequencing of material varied considerably, the essential philosophy was one of content delivery, with content understood as the characters and events of the mythology.

Historically, this course has always been taught in a face-to-face format. In his first first-to-face offerings of the course, the instructor adopted a similar approach. The course was divided into three units, each with a different thematic focus: creation myths, myths about gods, myths about heroes. Besides this content focus, however, he also adopted as a secondary focus and organizational principle, wherein, modern theories for the interpretation of myth with one theory at a time, was introduced in each unit of the course. This approach was intended to give the course a "skills based" approach, in keeping with current pedagogical best practices. Through a series of face-to-face offerings, emphasis on this feature of the course grew, to the point where a final unit was added, focused entirely on myth interpretation, and culminating in a final project in which students were asked to choose a method of interpretation to apply to a single myth.

The learner base in the course consisted of undergraduates from across disciples such as communication, political science and engineering. The outcomes of the course were (1) *(Understand)* Illustrate the major Greek and Roman myths; *(Understand)* Interpret myths in their ancient historical and social contexts; *(Analysis)*Examine how ancient myths pervade the belief structures of their own culture; *(Understand)*Identify various approaches to the interpretation of myth (e.g., psychoanalytic, feminist, structuralist, etc.); *(Apply)* Apply various theoretical approaches to Greek and Roman myth; *(Apply)* Identify mythological themes in various forms of culture from the Renaissance through today. When adapting the course for asynchronous online instruction, the change in format combined with the shorter time-table (from a 15-week to an 8-week term) meant the amount of work that students could be asked to do in the course - whether reading, writing, or other sorts of activities - would have to be increased. In stark terms, there was a choice to be made between breadth and depth. The instructor chose depth, and with it a radical change to the structure of the course. Now, skills in the form of myth interpretation would provide the backbone for the structure of the course. To make this possible, however, would require deep thought and the deployment of carefully developed tools for students to learn the basics of myth interpretation. This is where a cognitive tool such as ThinkSpace came in. With the new learning format, it was also necessary to revisit the interaction, course structure and the assessments to suit the needs of the online learners as well as be compliment the asynchronous online learning platform. The assessments in the asynchronous online format of the course consisted of weekly interpretive writing assignments, online discussions, short quizzes and a final paper.

Design Challenges and Considerations

There were various factors that guided the design process as the course transitioned to an asynchronous online platform. **Scalable Design**-the online format was chosen specifically to enable a larger enrollment of more than 100 students. **Class Management**-Grading challenges for a high-enrollment class that traditionally has had multiple essay-type assessments. Grading such assignments for a large enrollment class could pose a potential challenge for the instructor. Hence, assessments needed to be redesigned. **Concept Grasp**-Based on the in-class experience and feedback, the myths and theories were often challenging to interpret and apply, for learners, given their abstract content and unfamiliar context. Providing appropriate avenues to not only grasp the concepts but also develop the skills to apply those in a given scenario, in an online format, amplified the challenge. **Assessments**-Students needed to take away not only a knowledge of the facts of mythology but also a practical understanding of how to interpret mythology which essentially is a problem-solving skill set. The following section elucidates the process by which the interpretive writing assignments were redesigned in Thinkspace and the affordances of the tool.

Thinkspace-The Cognitive Tool

Cognitive theorists have stated that there is limitation to how much information the mind can process. Based on cognitive load theory (CLT) (Sweller,1988), theoretically, there are three typed of cognitive load-*Intrinsic cognitive load* (inherently irreducible components of a task); *extraneous* cognitive load that comes from irrelevant tasks under taken to accomplish the task and *germane cognitive load* that channels the resources in a helpful direction to accomplish the task (Pass et.al, 2003). *Thinkspace* helps in reducing extraneous load and increasing the

germane cognitive load. In this course, a Thinkspace case consisted essentially of three learning interactions (1) Data Collection (2) Data Synthesis- with explanations and appropriate interpretation. (3) Reflection- on the solution and comparison with an expert interpretation. In the first two learning interaction, students identified the relevant data and then provided with their explanation. In the last learning interacting, students compared their explanation with an expert solution. Hence, they receive relevant feedback at the highest moment of engagement for them. This increases the germane cognitive load and reduces the extraneous load.

Building of Thinkspace cases: The above-mentioned learning interactions were translated into a case consisting of four phases (Figure 1). In the first phase, students answered guided questions related to the given theory and gathered the necessary information (Figure 2). In the following phase, students compared and contrasted their line of thought with the 'expert answers'. In the final step, students wrote their own interpretation of the Myth and again self-reflected by comparing it with an 'expert interpretation' (Figure 3). All phases were mandatory for a case to be deemed complete. Students completed two Thinkspace cases weekly -the first an ungraded practice case and the second a graded case.

Overall, students were completing eight cases that dealt with four different theories for myth interpretation and application with varied degree of complexity. Instructor reviewed each phase and provided feedback wherever necessary. Thinkspace provided the Instructor the provision to create a comment library over a period of time. This proved to be an efficient class-management tool which was used considerably by the instructor for providing comments and feedback to the students. Students could also view their responses at any time during the semester. Part of the cases included questions related to the final project that students were asked to answer. These responses helped students prepare for the final project where they had to interpret a given Myth using the theories they had learned during the semester. Both the instructor and students could also contact the technical support any time they had any such issues. The response time for such queries was less than 24 hours.

Hence, the scaffolded learning opportunity, timely feedback, scalability of the assessments, efficient grade management strategies and prompt technology support made Thinkspace an appropriate learning tool in this course.

Figure 1: The four-different phase in a Thinkspace case.

Figure 2: Question students have to answer before proceeding to the next phase.

Figure 3: Expert Review and Self-reflection

Students Experience

This course was an eight-week long Summer course offered in Summer of 2017. Students(N=69) in the course were administered two surveys in the fifth week of the course. The 'Mid-Semester Survey' which evaluated user experience and course alignments and the 'Thinkspace Experience' survey to evaluate student perception about perceived usefulness of using this tool in the course. The response rate was 69% (N=32). The latter survey was adopted from the Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology (Davis, 1989). The surveys had a 5-point Likert Scale range ranging from Strongly Agree to Strongly Disagree. Both surveys had an open-ended question. The survey was analyzed through descriptive analysis.

Questions	Strongly Disagree (%)	Disagree (%)	Neither Agree or Disagree (%)	Agree (%)	Strongly Agree (%)
The course content would be difficult to learn without the use of the Thinkspace.	3	35	28	31	3
Using the Thinkspace gives me greater control over my learning.	6	13	31	44	6
Using Thinkspace improves my learning of the content.	6	9	13	63	9
Thinkspace addresses my learning needs	9	6	38	41	6
Thinkspace saves time in gathering resources	6	16	19	40	19
Thinkspace enables me to accomplish tasks more quickly	9	22	22	44	3
Thinkspace supports critical aspects of my learning the content	3	6	13	69	9
Using the Thinkspace enables me to accomplish more work that otherwise be possible.	0	19	22	50	9
Using Thinkspace reduces the time I spend on unproductive activites.	6	19	31	41	6

Using the Thinkspace promotes effective learning.	3	9	22	60	6
Using Thinkspace improves the quality of the work I produce	6	16	16	53	9
Thinkspace increases my productivity.	3	13	45	32	7
Thinkspace makes it easier for me to produce my work	6	16	16	53	9
Overall, I find Thinkspace an useful aid in learning the content of the course.	6	10	16	61	7

Table 1: Thinkspace Experience Survey

Questions	Strongly Disagree (%)	Disagree (%)	Neither Agree or Disagree (%)	Agree (%)	Strongly Agree (%)
Learning objectives (what I will learn in this course) and learning outcomes (what I will be able to do as a result of this course) are clearly stated and understandable.	0	0	0	52	48
The activities (discussions, group work, homework, presentations) support learning in this course.	0	0	4	48	48
The instructional materials (video lectures, readings, homework etc.) are current and have sufficient depth for me to learn the subject.	4	0	8	46	42
The instructional materials are easy to access and download.	0	0	4	33	63
The assessments (homework, quizzes, exams, projects, etc.) are appropriately timed, scheduled, and appropriate to the content being assessed.	0	0	4	44	52
How easy was it to locate the course syllabus and schedule.	0	0	8	4	88

Table 2: Course Navigation Survey

Overall, the course received a positive feedback from the students as per the Mid-semester survey. 46% of respondents agreed that the instructional material had sufficient depth to learn the subject and 48% of respondents agreed that the activities in the course supported their learning (Table 2). The Mid-Semester survey results also indicated that the learners found it easy to download all instructional materials and that all assessments were appropriate to the content being taught.

From the Thinkspace Experience survey, 63% of the respondents said that using Thinkspace improved their learning where as 69% reported that Thinkspace supported critical aspects of learning the content. More than 50% of respondents agreed that Thinkspace improved the quality of the work being produced (See Table 1) and that it promotes effective learning. More than 60% of respondents indicated that Thinkspace aided their learning the

content of the course. The open-ended comments were categorized into the following categories (a) general comment (b) learning curve/ease of use (c) aid understanding and application of concepts. Some of the comments from the students related to the use of Thinkspace in the course were:

"I think the learning curve was average, it made you analyze but some of the questions could of been better. The expert answers were great. I liked this format."

"Sometimes they help and sometimes they don't. It just honestly depends on the format of thinkspace that we're doing that week."

"I think that having the expert response on Thinkspace really helped me. It was hard to come up with the answers
to those questions on my own but having the expert response helped me to learn where I was right and where I was wrong".

Overall, the results of the Thinkspace Experince survey and the Mid-Semester Survey indicated that the course design had a positive impact on the students. The results indicated that students perceived the tool to be useful in aiding them learn the content of the course. The user experience also appeared to be favorable as most of the students were able to navigate through the course and were able find the resources and learning content easily.

Conclusions

Instructor perspective: I have been generally pleased with the way Think Space has helped my students master the difficult material that is applied myth interpretation. There were some early technical difficulties related to giving and receiving instructor comments (an essential part of the learning process), but these have been resolved in subsequent course offerings. Similarly, the specific steps in each case have been refined more than once, based on student results and interactions in face-to-face classes.

The use of Thinkspace was a novel attempt at re-interpreting the course, specifically the interpretive writing assignments. Thinkspace integration scaffolded the learning- breaking down the processes of interpretation of a Myth into steps that could be easily adopted by the mind. Secondly, it provided the students an environment where their thought processes could be organized and provided ample opportunities of self-introspection and reflection before a plausible conclusion. The 'expert views' which furthered the opportunities of self-learning and reflection (Collin, Brown and Newman, 1989). This approach of problem solving and learning helped in sorting through extraneous information and maximized the germane cognitive load (Pass et al., 2003). Furthermore, the affordances of the tool, such as expert response, timely feedback, reduced complex grading, a comment library, proved to be effective class management strategies for a novice online instructor transitioning into an online format in a high enrollment course. Implementing a cognitive tool in this course not only redefined the role of the instructor but made learning more engaging for a diverse group of learners.

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