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CUSTOMIZING STUDENTS' LEARNING EXPERIENCES WHILE DESIGNING AN ONLINE COURSE

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This design case illustrates an innovative research-based pedagogical approach to customizing students' learning experiences in an online course. We centered the course design on the experiential learning model which fosters student's learning through a reexamination and integration of their current knowledge with new and refined knowledge (Kolb, 1984, 2015). Through experiential learning we better served the purpose of the course because it provided opportunities that involved concrete and hands-on experiences with real life activities/projects, reflection on learning, and learning gains. Further, we incorporated elements of game design to transform the learning space into a study and play alternative, where students enhanced their learning and performance and benefited from study work that was engaging, productive, and pleasant (Prensky, 2001).

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INTRODUCTION

One of the challenges we face in online learning environments is giving students opportunities to personalize their learning according to their own needs and interests. An online course that is rigid and ignores the prior experiences of the learner will unlikely lead students to meet their learning objectives, result in a successful learning experience, and encourage students to employ their knowledge and skills in other contexts (Kolb & Kolb, 2005). However, incorporating flexible schedule and real-life activities that foster independent and autonomous work in a web-based learning management system (LMS) is difficult. Therefore, we sought to integrate learning approaches that could facilitate personalizing the learning experience and integration of previous and new knowledge. It is with experiential learning (Kolb, 1984) and a few gaming elements (Prensky, 2003) in mind that we re-designed the online graduate course *CI 505: Introduction to Technology in Teaching and Learning*. Experiential learning helped us to plan, design and develop learning experiences with opportunities for student directed learning, personalization, and, particularly important for this online course, interaction.

In addition to the unique application of experiential learning and gaming elements in an online environment, we also formed a teaching assistant-instructor partnership during course development. A course instructor and a teaching assistant in the course worked side by side in all design decisions and stages of the course development, implementation, and evaluation. These stages included: developing the learning objectives and outcomes, creating learning tracks (i.e., content, resources, activities), creating assessments, facilitating discussions (e.g., synchronous webinars and asynchronous discussion forums), and evaluating the course. Aside from the learning objectives and outcomes, all the remaining stages were developed while the course was in progress. We brought our unique and specific didactic perspectives into the design, which shaped the entire landscape of the course. The teaching assistant, a former student in the course, offered a perspective on resources and activities that complemented the instructor's focus on national standards for technology integration.

Throughout this design case, we describe the design decisions we made and present the accomplishments and challenges that implementing experiential learning with few gaming elements brought while working in this partnership.

CONTEXT OF THE DESIGN

The School of Education at Iowa State University has a robust online M.Ed. program in instructional design that includes foundational courses in instructional technology, research methods, and philosophy of education. *CI 505: Introduction to Technology in Teaching and Learning* is one of the first courses in the program of study, but it is also a course open to other students in the School of Education. Students in the course CI 505 experience both the "how" and "why" of using digital technology in classrooms. In this course, students work on practice activities allowing them to explore and utilize technologies such as online discussion forums, social media applications, educational games, digital storytelling, augmented reality, 3D printing, and other digital applications that improve learning experiences. The content in this course is mostly focused on four conceptual areas aligned to the 2015 Standards for teachers developed by the International Society for Technology in Education (ISTE, 2015): (a) theoretical foundations of instructional technology, (b) problem solving with technology, (c) creativity and technology, and (d) digital citizenship.

The student evaluations of the course in Fall 2013 prompted the changes in course design. Although the overall instructor evaluation was high at a 4.0/5.0, student comments indicated two areas of needed improvement: (a) meet the diverse academic needs of the students and (b) address varied interests and skill levels with technology. With an enrollment of 15 students, the population in this course was typically a mix of K-12 teachers and non-teachers. Of those without teaching experience, career interests included instructional design, industry training, and information technology. One student mentioned that she "would consider the background of the individuals in the classroom," and another corroborated that the "instructor needs to consider the background knowledge that students are bringing in." Having taught this course for several semesters, the instructor acknowledged that there was room for improvement in meeting the individual needs of students. The instructor also felt the need for a better way to maintain consistency of course structure and delivery between semesters even with a dynamically changing student population in the course.

In order to address the diverse needs, interests, and skills of students in this course, the re-design included four broader content areas encompassing digital citizenship, how people learn, creativity, and problem-solving. Each of these content areas included three tracks with topics related to the ISTE (2015) standards and activities that can be carried out in school settings as well as in industry settings. Further, each of these learning tracks employed a series of activities with different levels of difficulty and required expertise so that students could choose which best suited their needs and interests. This course re-design aligned course goals and objectives to research-based curricular models while dynamically allowing for student choice. To meet this objective, we structured the course using the principles of experiential learning and game-based learning to increase student engagement and scaffolding with the material. In addition, we changed from a blended format (50% online, 50% face to face) to an online format (90% online and one face-to-face meeting at the end of the semester).

The Design Team

The course instructor, Larysa Nadolny, is a faculty member in instructional technology in the School of Education. Larysa strongly believes that students must create and construct their own meaning from learning experiences. Her teaching philosophy is rooted in the work of theorists Piaget and Papert. When designing for learning, she pushes students out of their comfort zone, but she also ensures they feel safe to fail and try again.

The co-designer for the online course, Nadia Jaramillo Cherrez, is a doctoral student in the School of Education. Nadia took the course CI 505 the previous year and was acquainted with the course objectives, content, and requirements. She strongly believes that learning can occur when students experience rich interaction with opportunities to connect theory and practice. She believes that this connection will allow students to engage in learning activities more in depth, work collaboratively, co-construct knowledge, and enhance critical thinking. Additionally, she considers that the learning experience can be enhanced when students develop and sustain self-regulation, allowing them to personally develop cognitive, metacognitive, motivational, and behavioral strategies that enhance their learning (Zimmerman & Schunk, 2011). Her work in the course focused on supporting students in academic and technical aspects. She also helped develop the content of the course and monitored students' progress. Her previous experience in this course, along with the experience she gained in her studies, was helpful for the re-design of the course.

We, the designers and course instructors, worked closely on designing a learning experience that fostered independent learning, real-life projects, collaboration, and communication. We acknowledge that online teaching and learning requires basic technical skills, but mostly it requires appropriate guidance, timely support, and active strategies that lead students to take ownership and responsibility for their learning process (Standards for Quality Online Teaching, 2006; Keengwee & Kidd, 2010; Chickering & Erhmann, 1996).

PEDAGOGICAL APPROACH TO COURSE DESIGN

The approach to our design case provided students with opportunities to exploit their creativity, develop their critical thinking skills, and immerse themselves in deep reflections about the field of educational technology. This design case gave us a venue to incorporate a pedagogical approach for students to advance their learning and professional development. Throughout the experience of the design, we were open to trying out alternatives with regard to content and activities that promote a richer learning experience. Our experimental approach was evolving and growing over time, making the course more engaging for students, and even for us as course designers.

We centered the course design on active and motivating pedagogical strategies, specifically the experiential learning model. This model shows how student learning is fostered through a reexamination and integration of their current knowledge with new and refined knowledge (Kolb, 1984, 2015). In experiential learning a student proceeds through a cycle of acquiring new information, making sense of this information, and then applying it to new situations (see Figure 1). Kolb (1984, 2015) in his experiential learning framework suggested a learning model that encompassed a 4-stage cycle: (a) concrete experience, (b) reflective observation, (c) abstract conceptualization, and (d) active experimentation. Students that go through this cycle will engage in concrete experiences with the learning material and course activities. Through reflective thinking, students will conceptualize these experiences and have better understandings of theoretical aspects already explored. Students, then, will apply and experiment what has been learned by using high-order thinking skills and by embracing new concrete experiences.

The aim for the CI 505 course was to provide students with opportunities to gain knowledge through a transforming experience (Kolb & Kolb, 2005). While looking into the objectives and learning outcomes of the CI 505 course,

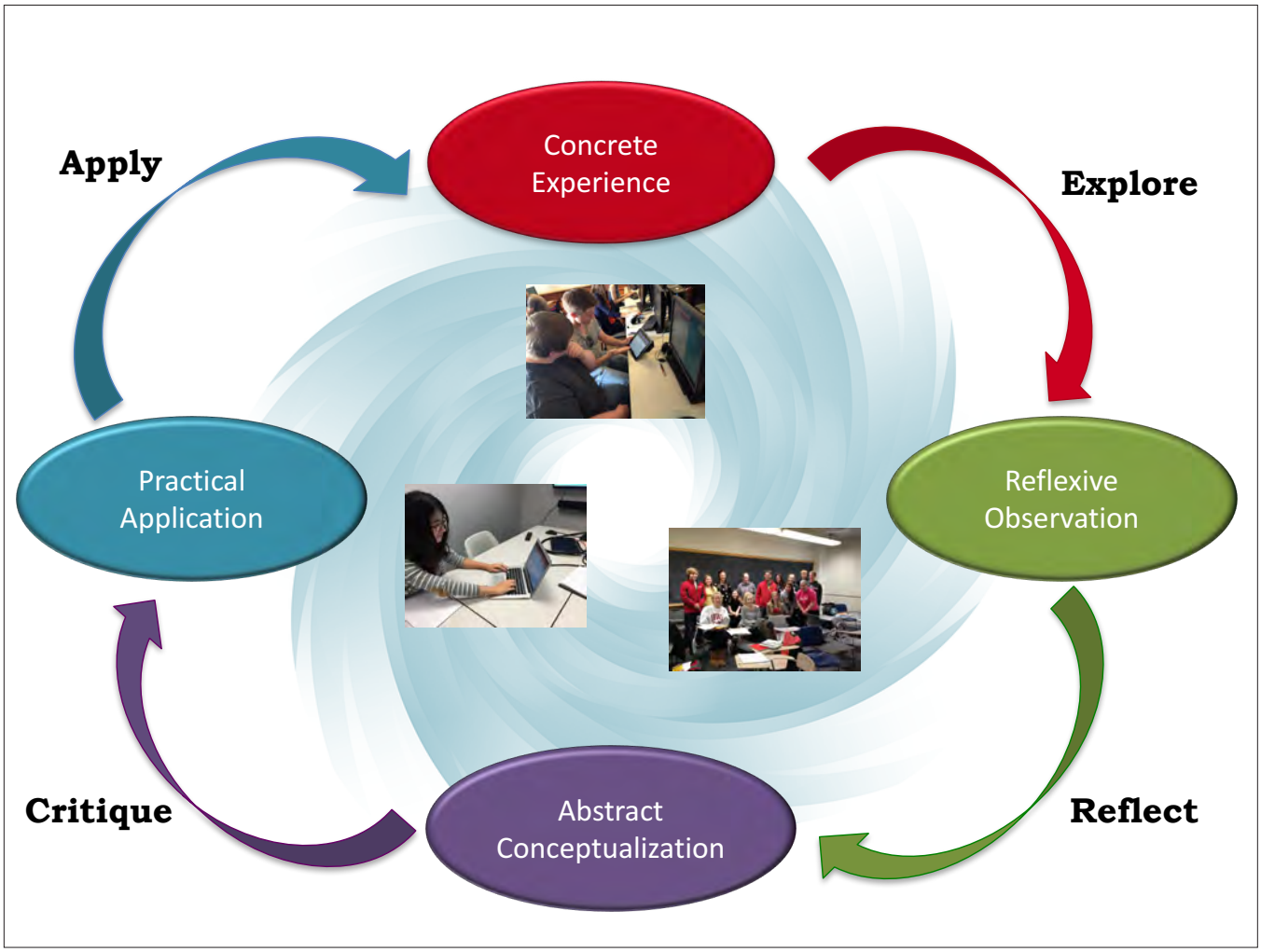


FIGURE 1. Four-stage cycle of Experiential Learning (based on Experiential Learning: Experience as the Source of Learning and Development (2nd Edition). Ch. 2: The Process of Experiential Learning, Understanding the Learning Cycle. By David. A. Kolb, Upper Saddle River, New Jersey, by Pearson Education Inc., [2015].

experiential learning was the pedagogical approach that better helps to accomplish the objectives and outcomes because it would provide opportunities that involve concrete hands-on experiences with real life activities/projects and reflection on learning and learning gains. Students would work on concrete individual and group activities that allowed them to be critical and reflective about their own learning process. Our vision on experiential learning as the underlying framework aimed to immerse students in a learning space for a meaningful experience that was useful and relevant to their own professional work and that promoted growth in their own life (Kolb & Kolb, 2005). This learning space involved concrete experience where students were exposed to an overview activity where they had opportunities to explore concepts and theoretical aspects of the topics studied. Following this activity, they engaged in observing how the concepts and applications were used in practical examples. This encouraged students to reflect on the connections between theory and practice. For abstract conceptualization, and having been exposed to the theoretical and practical underpinnings of the topics, students worked on applying their critical thinking skills to criticize, analyze, and evaluate additional examples, practices, reflection questions, and problem-solving cases. Through this critiquing activity, students would become more knowledgeable about the intricacies of pedagogical and technological considerations for teaching and learning. The final stage of the experiential cycle was the application of knowledge and skills. For practical application, students worked on a project related to each of the topics studied. They applied the theoretical aspects covered as well as engaged in practical development of real life learning activities (e.g., organize a social media discussion, make impact through a technology-based problem-solving action).

Further, we decided to combine experiential learning with game-based learning to transform the learning space into a study and play alternative, where students could enhance their learning and performance (Prensky, 2001). As game-based learning is "where specific problem scenarios are placed within a play context" (Tsai & Fan, 2013, p. 115), we incorporated elements of game design in the learning space so that students benefited from study work that was engaging, productive, and pleasant (Prensky, 2001). We selected elements of choice and difficulty that could be combined within each of the activities. A series of assignments named "learning tracks" were grouped together thematically, all leading to the same project. The elements of game-based learning that we included in this course were:

- **STUDENT CHOICE:** Students selected one track and the project for each area. Everyone began with the same track as the starting point. As students advanced in the course, the choice of other tracks was theirs.
- **ADAPTIVE RELEASE:** In most tracks, students would only be able to see one assignment at a time. The other assignments would be released after submission of the previous assignments. We believed this would keep students focused on the current task and engaged with the new material.
- **INCREASING CHALLENGE:** Each component of each track (overview, explore, reflect, and critique) had a different level of difficulty. The explore task was easier requiring students to watch a video on the topic or explore some websites, while the reflect, critique, and apply assignments were increasingly difficult requiring students to engage in application of the content studied.

We decided to limit the number of game-based learning elements such as competition, badges, prizes, and levels, as it would have been more of an overwhelming experience to students rather than a learning opportunity. By including a few gaming elements, we aimed to give students situations that required them to access several sources and formats of information, make decisions, create their own strategies to move forward, collaborate with others, overcome difficulties, and find solutions through experimentation (Prensky, 2003). By adding game-based learning elements, we believed that students would be motivated to achieve higher scores and engage with content in new ways.

COURSE DESIGN AND EXPERIENCE

Our experiential framework contained opportunities for students to explore, reflect, and engage in critical analysis of information and experiences. This was complemented through concrete experiences that allowed students to make decisions, be creative, take initiative, and connect work in the course to their own professional endeavors. As we developed the course we were able to envision the students' learning process as an opportunity to connect the course content to their own professional work. For this, we focused on finding resources that were reliable, made connections to real contexts, provided students with research-based knowledge, and engaged them in activities that required active participation, decision-making skills, and reflection.

The content gave students ample and flexible opportunities to engage in academic work as well as in social, collaborative, and interactive activities to grow in their knowledge and understanding of why they were doing what they were doing. Students in this course had opportunities to reflect on their own work, learn from mistakes, become more accountable for their learning, and build upon their success along the way. These opportunities were given through a resubmission-improvement grading system that allowed students to submit as many materials as they could to support their assignment (e.g., videos, multimedia, screenshots, handouts, and data). They also could submit an informal reflection or other notes that would help the instructor evaluate their work. Through a system of multiple attempts, students could resubmit their assignments and improve their grade.

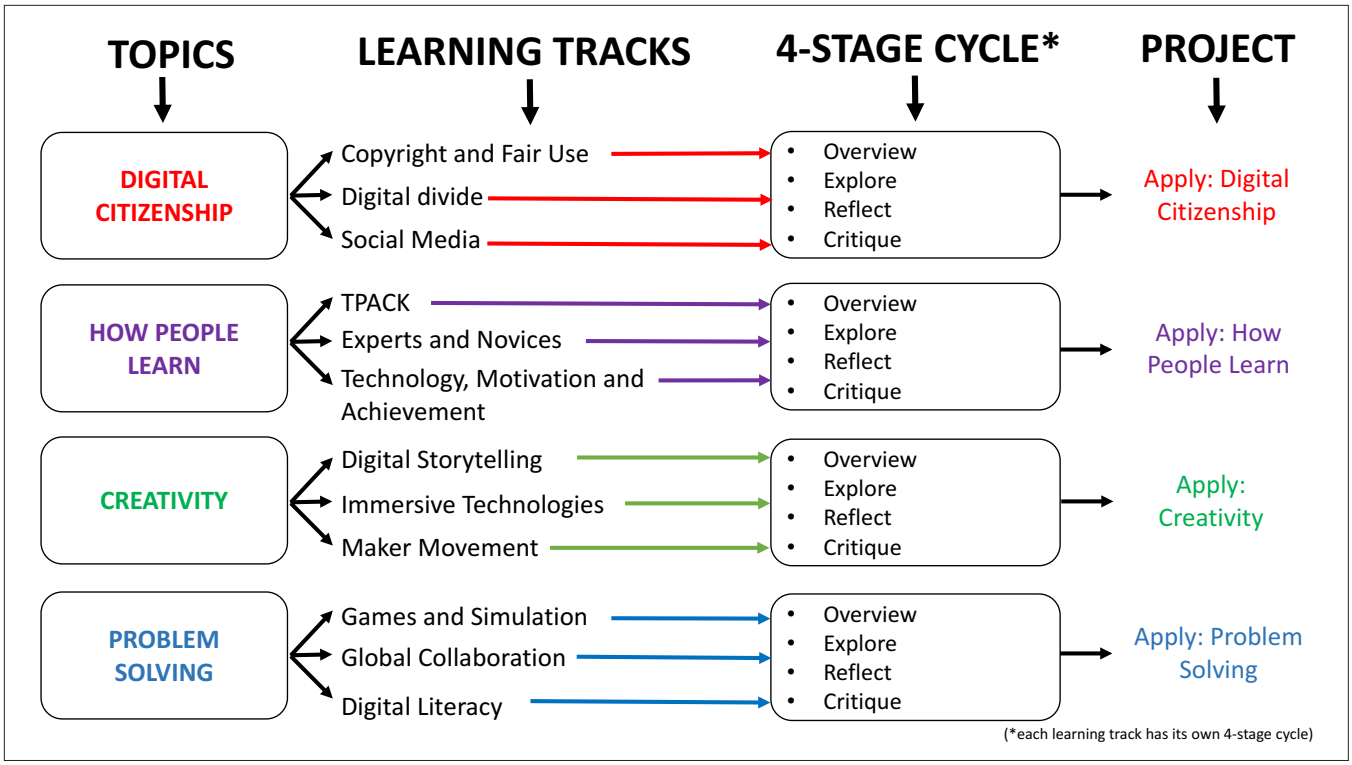


FIGURE 2. Visual design of the course structure illustrating the connections among the topics, learning tracks, and projects.

The design phase brought about several concerns in regard to the flexibility of the schedule. For instance, how do students know when to submit an assignment? When should they start working on the project? Can they work on several content areas at the same time? These concerns were addressed during our regular weekly meetings. At these meetings, we discussed the scope of the learning outcomes, decided what learning track would be designed next, identified what kind of resources we required, clarified and exemplified assignment submission, and outlined activities for live webinars. We also discussed how the course structure would reflect the flexibility, choice, and meaningfulness we wanted to give students. Building on the 4-stage cycle, we outlined the course structure as a series of activities (overview, explore, reflect and critique) grouped according to four content areas (digital citizenship, how people learn, creativity, and problem solving; see Figure 2). These activities made up what we called learning tracks, which offered flexibility of schedule and choice. In order to meet our goal of flexibility, students could decide when to submit their assignments before the end of the semester. The only specific deadline, explicitly stated in the syllabus and emphasized during the first live webinar, was the date for final exams, when all assignments should have been submitted. Unfortunately, our expectations about students' understanding and clarity on the flexible schedule showed a mismatch. We strongly believed that students would easily manage their time and assignments to submit them ideally every two or three weeks. This was not the case. We came to question our decision about this open submission process free of deadlines. The lack of specific short-term deadlines and reinforcement of expectations on assignment submission seemed to add some confusion to the structure and requirements of the course.

Meeting the Needs of Diverse Students

The online course was divided into four main sections:

- Start Here (resources and guidelines about the course and requirements),
- Learning Tracks (content and activities),
- Projects (hands-on / application activities), and
- Central Hub (Webinars and Discussions).

Within the Learning Tracks, we selected four content areas for the course aligned to the national standards, and content of the course from the previous semester (see Figure 3). Even though the course was divided into compartmentalized areas, the content did not follow a traditional linear structure. Each learning track gave students the flexibility and freedom to select which path to proceed. For example, students entering the digital citizenship areas could choose to work on copyright and fair use, social media, or the digital divide. All three of these learning tracks were structured in a similar way but contained different information. Visually, we decided to use an arbitrary color-schema per content area so it would be easier to identify and relate every content area to

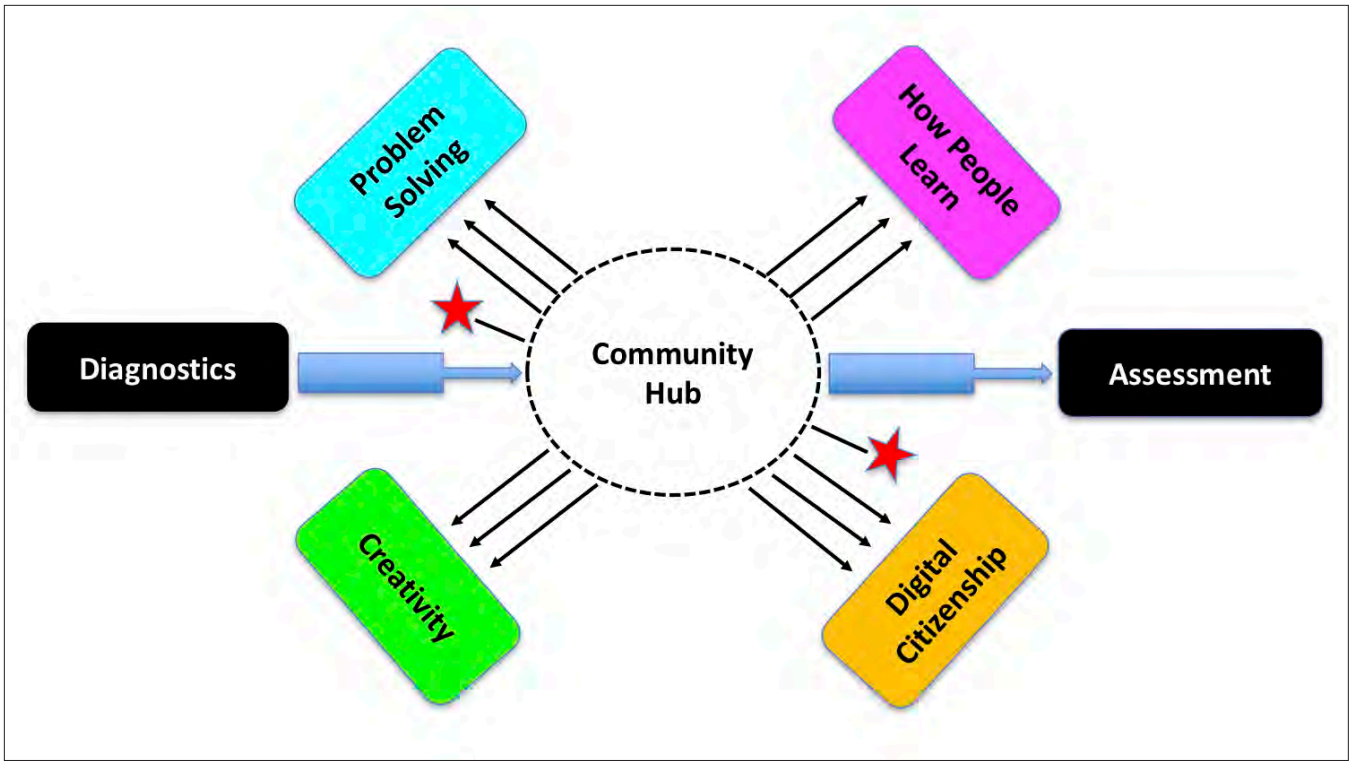


FIGURE 3. Design and structure of the course based on content areas, learning tracks, central hub, and projects.

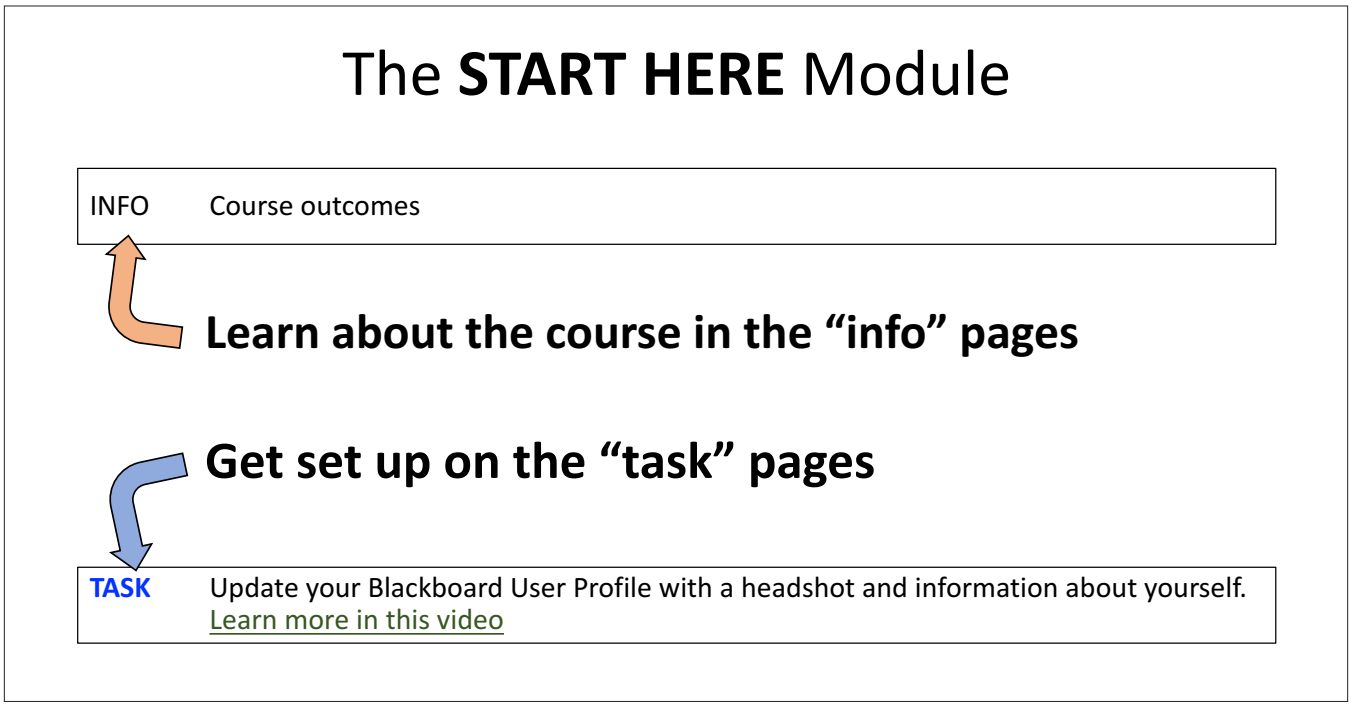


FIGURE 4. Start Module with both types of information: a) INFO, and b) TASK.

its learning tracks. This also helped to locate how many and which learning tracks were available.

The instructor of the course developed the grading schema per topic and per learning track. This schema required students to complete at least four learning tracks and all four projects. The course began with only one learning track in the content area digital citizenship. This was the first track required for everybody, which we believe resembled how games are initiated for the first time. We decided not to tell students which learning track to choose next or which learning path to choose because we believed that the flexibility of selecting learning tracks would give students opportunities to explore different topics and perspectives in the field of educational technology according to their needs and interests. At this point all students were navigating the course alone; however, they did receive guidance and support. This was precisely the focus on choice and flexibility; students could select what and how they wanted to work.

Most of the students, although on different paths, advanced similarly along the semester. Each content area had three different learning tracks, all leading to the same project. Although students had flexibility to choose the learning tracks, students had to work on all four projects regardless of the number of learning tracks they had completed. The project represented the capstone of each content area in which students would connect the content studied to a hands-on, practical, and real-life project. Further, students could choose to complete as many learning tracks as they wanted; the more learning tracks they completed the more points they would add to their grade. Students had a resubmission schema to improve grades, which included the following options: (a) Accepted (90-100%), (b) Revise and Resubmit (75%), and (c) Not Accepted (50%). Each learning track was worth 20 points and each project was worth 30 points. We selected this grading schema to help students focus on the learning experience through gaining points as they completed the tracks rather than on specific time periods during the semester with fixed deadlines for submission of assessments. We believed this system would raise students' awareness of their own learning strengths and needs, encourage them to manage their time, and help them identify learning strategies to reflect on their learning and performance throughout the course.

We developed additional learning tracks as the course progressed and released them approximately every two weeks. We designed and released one learning track per content area at a time in order to give students options to choose. Additionally, we built every learning track with the same structure in order to keep a consistent layout, design, and navigation. We decided to make the learning tracks available progressively to bring about the element of adaptive release forward. In other words, tasks appeared after previous work had been completed.

Our underlying framework based on experiential learning and gaming added an innovative learning milieu to the course. However, for the teaching assistant this new route of the course was challenging and, at times, incomprehensible. Her view of the course was restricted by the linear structure she had experienced when taking the course the previous

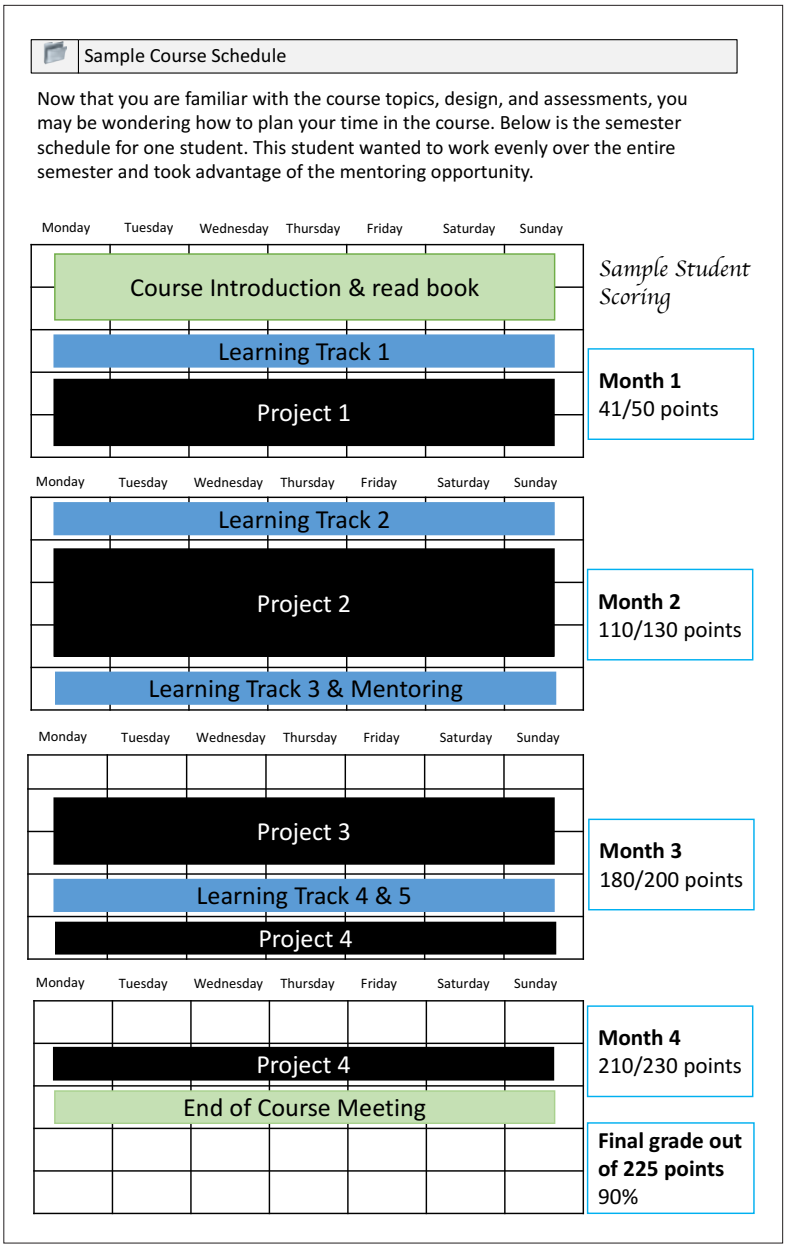


FIGURE 5. Visual representation of learning progress throughout the tracks.

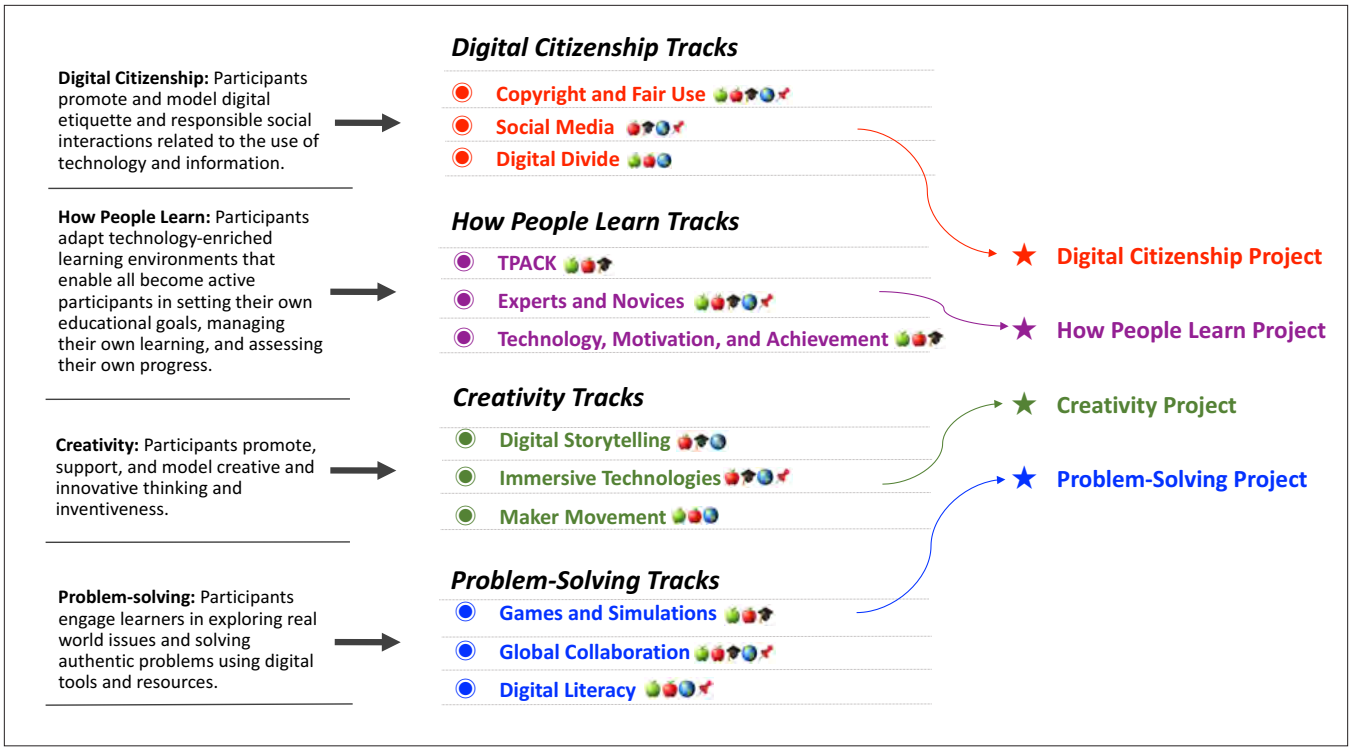


FIGURE 6. Connection between the content areas, learning tracks, and projects.

year. Therefore, she came to the realization that transitioning from a structured pattern to a more flexible and iterative pattern meant an experimental and innovative approach to learning that allowed personalization of the learning experience, offered freedom to select one's own learning journey, and fostered accountability for own learning. Having embraced a better understanding of how both frameworks could support the design of the course, the teaching assistant looked for course materials and resources that were aligned more to the outcomes, which offered opportunities for reflection and experimentation.

Interactive Course Design

Start Here: The Orientation Module

We decided to create a Start Here section to give students an orientation to the course and its requisites prior to beginning the actual work with the course content. In this section students could navigate through the syllabus, course objectives, resources, course policies, assignments, tools, and materials required. We thought of this section as the road map of the course with resources necessary to familiarize the students with the concept of course design, content, and structure. We created two types of pages in this section: (a) The INFO, and (b) the TASK pages (see Figure 4). The INFO page provided students with information about the course such as: syllabus, objectives, format, policies and resources, design, teaching team, weekly webinars, assignments, schedule, required textbook, and the tool Video Everywhere (integrated in the LMS, Blackboard LearnTM, used at Iowa State University when the course was offered). The TASK page gave students information about a task they needed to do before starting work with the content of the learning tracks. The tasks included signing up for a Google mail account to be able to participate in the weekly webinars through online video conference provided through the online Google Hangouts application. We also included a self-introduction activity for students to share information about themselves by using a video recording, a cartoon, or a presentation. With this introduction, we wanted to create a connection among students, the instructor, and the teaching assistant. We believed this connection could help students realize of the potential for team work and support from peers and instructors in the online course.

We updated the Start Here section regularly as the course progressed in order to clarify students' concerns or confusions with the design. Although several students figured out their own route through the course, others struggled to determine their own progress. During the third live webinar and via email, a few students requested a visual representation of their advancement in the course because it did not include deadlines for the activities and assignments. It seemed that students found it troublesome, and at times puzzling, not to have specific deadlines for the submission of assignments. Therefore, at week four and upon students' request, we designed a roadmap with estimated times for work on activities and the project and for assignment submissions. This road map was a sample map of the progress in the whole semester for a single student (see Figure 5). We

provided an estimated time for how long it would take students to complete one learning track: 1-2 weeks without the project and 3-4 weeks with the project. This gave students a more precise idea of the time they would need to achieve the minimum number of points required for the course. The roadmap was displayed in the online course page and remained available throughout the course. Student could use this road map as a point of reference to track their own progress in the course. Students mentioned during the live webinars that they felt more confident navigating the learning tracks and adjusted their mindsets to the course structure. They also realized that they needed to follow their own pace and develop a sense of regulation that could keep them working steadily, focusing on the assignments, and monitoring their own progress.

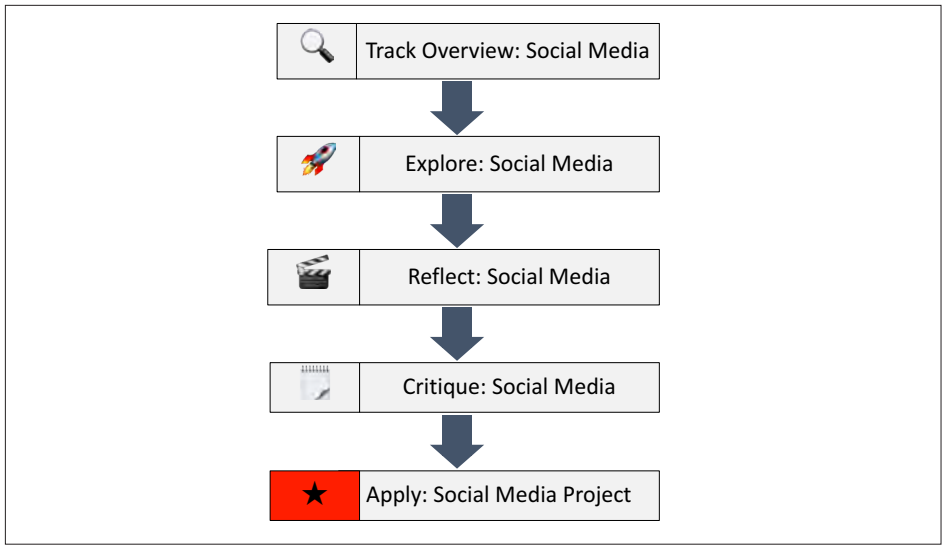


FIGURE 7. Sequence of components in each learning track that ended with the project.

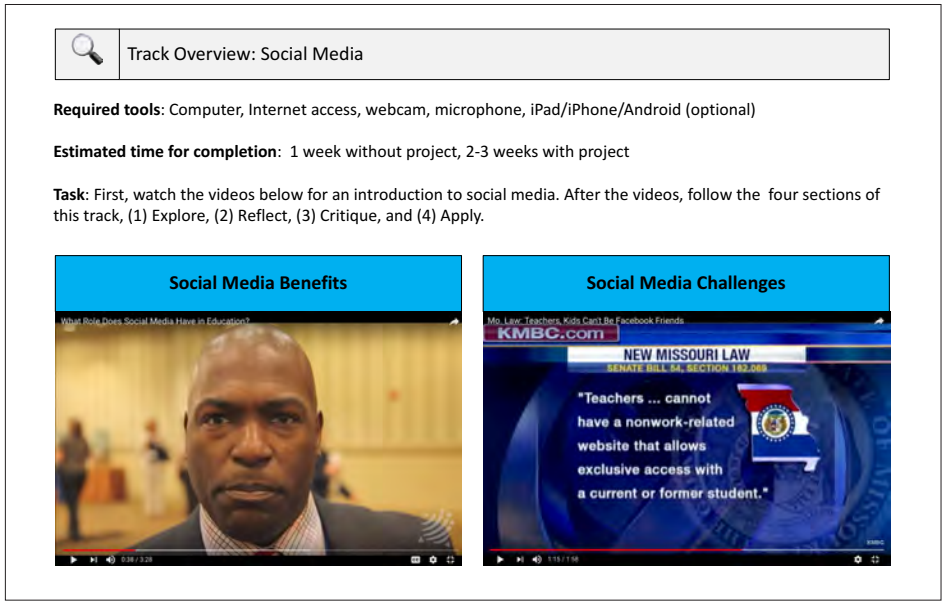


FIGURE 8. Social Media Overview component to trigger students' prior knowledge of the content.

Learning Tracks: The Course Content and Activities

We created four content areas: (a) digital citizenship, (b) how people learn, (c) creativity, and (d) problem solving. All four content areas led each to a different project (see Figure 6). Each of these content areas had three learning tracks aligned to the experiential learning cycle. Within every learning track, we added four similar components following the stages in the experiential learning cycle:

1. Concrete experience will be overview
2. Reflective observation will be reflection
3. Abstract conceptualization will be explore
4. Active experimentation will be critique and project

We selected these four components to help students build their knowledge from a stage in which they explored the content and got familiar with the learning material and resources to a stage in which they used their high order thinking skills such us appraising, critiquing, and creating content. These four components built one upon the other to make the learning more meaningful, integrated, and refined with additional knowledge, ideas, resources that students contributed themselves. Every component in the learning tracks was essential to the accomplishment of the project (see Figure 7), which was the capstone for each learning track.

To illustrate the connection of the components in each learning track, we describe each component with examples from the social media track as follows:

OVERVIEW: With this component, we aimed to trigger students' prior knowledge of the content. Students would explore several introductory resources including videos and links to websites (see Figure 8). We also referenced national standards and learning objectives for each track.

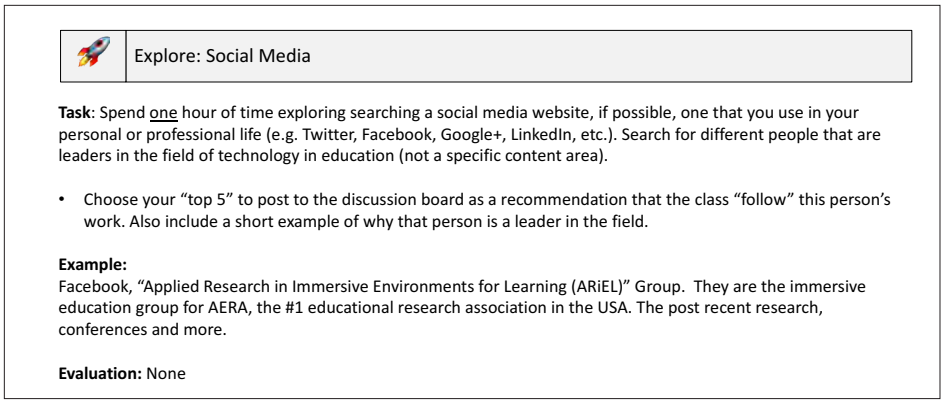


FIGURE 9. Social Media Exploration component to engage students in trial-and-error approach to learning.

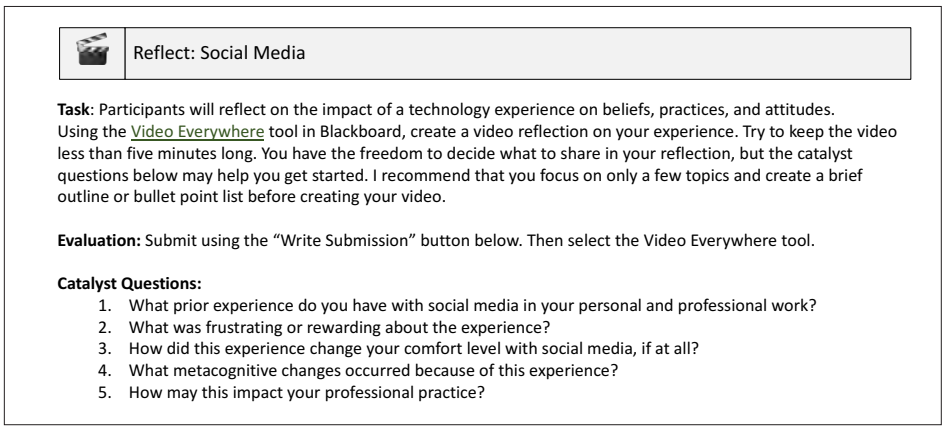


FIGURE 10. Social Media Reflection component to reflect on prior experience and exploration of technology.

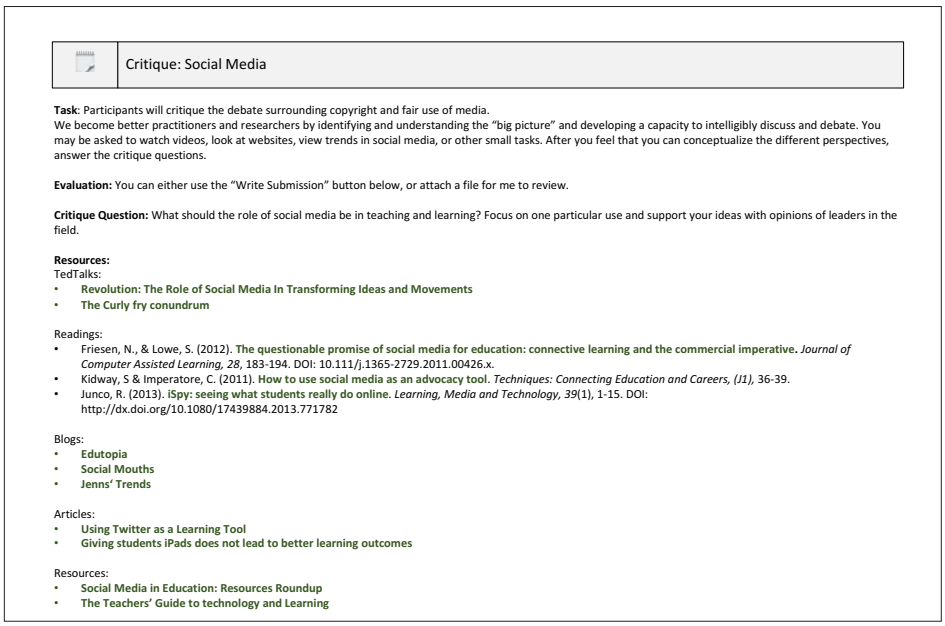


FIGURE 11. Social Media Critique component to conceptualize diverse and broad perspectives on the topic.

EXPLORE: This component was designed to build technical skills and practical knowledge through exploration of digital resources. Students were expected to spend about one hour exploring and navigating through the content of this component before they engaged in discussion about the topic (see Figure 9). This component emphasized a trial and error approach to learning.

REFLECT: With this component, we required students to record a 5-minute video using the tool Video Everywhere within the LMS. Students would reflect on their prior experience with the content and experience exploring the technology (see Figure 10). Students were expected to provide in-depth connections among the content to which they had been exposed, their actual professional practice, and theoretical aspects. The selection of video for this assignment implied that students would be more spontaneous and genuine in describing their experience using a live-recorded video rather than a written piece.

CRITIQUE: The critique was a written assignment responding to complex questions on the topic.

We expected students to conceptualize diverse and broad perspectives on the topic, and develop a capacity to intelligently discuss and debate these perspectives (see Figure 11). To prepare for this assignment, students were provided an extensive list of resources and materials (e.g., websites, educational videos, blogs, news, and research and practitioner articles) to enrich their understanding and knowledge. The resources would allow students to envision what and how they approached the research topic, how industry and educational

institutions implemented the resources, and how experts and practitioners in the field discussed the themes.

By including four components in every learning track (overview, explore, reflect, and critique) we sought to engage students in a process of building up knowledge and experience along a continuum. We believed that this helped expose students to content, and develop a general understanding on the topic, prior to engaging in more complex activities that promote deeper development of cognitive skills. Our decision to have the same components in every learning track was based on our assumption that it would make it easy for students to understand what to do next, focus on the content, build knowledge coherently, and engage in application activities that resembled real-life contexts. These four components were required to be completed sequentially prior to doing work on any of the projects. We designed these components to give students a structured, logical, and connected navigation in the learning process. Additionally, for the gaming elements, like in any game we decided to start the course with one learning track, giving all students a common starting point. For the starting track, we chose fair use and copyright in the digital citizenship content area. We decided to start the course with this track since the forthcoming content and assignments would likely make use of the information in this track. Once they finished working on that track, they could choose other available learning tracks.

Further, despite our vision of embarking students on a logical and coherent sequence of activities (e.g., overview, explore, reflect and critique) that exposed students to a meaningful learning experience, it seemed that students expected a more structured course with specific deadlines for assignment submissions, lecture videos, and other activities that they thought should receive a grade. Not giving them a score for the overview and exploring activities frustrated students as evidenced in the reflections and feedback they provided at the face-to-face session at the end of the semester. At our regular meetings, we discussed these frustrations in some students as they expected to have a broader range of learning tracks from the start of the course. Students communicated their concerns during the live webinars, via email, or in the discussion forums. In order to make students feel more at ease in the course and leverage their learning, we explained how the course was structured, how they had flexible content and choice, and the requirements. We expected this explanation would ease students' concerns and guide them on what to do to accomplish the learning objectives.

Since this course was a re-design that took an innovative learning approach, we did not have the time to develop all of the learning tracks at the start. We built and released learning tracks progressively over the course of the semester. We eventually became more efficient in finding effective resources; for example, we used educational videos from reliable sources (e.g., Edutopia and EdTalks) and educational organizations. Once a learning track was developed, we made it available on the online course. We informed students about the new track through the internal announcements service within the LMS, we also added the label *new* next to the name of the new learning track as a visual hint. By the end of the semester, all twelve learning tracks were developed and released. The fact that we released the learning tracks progressively reflected the gaming element of adaptive release; an attempt to keep the students more focused on the current work rather than exploring all tracks at once.

During the face-to-face session at the end of the course, students acknowledged that they were engaged in activities that required them to apply what they had learned. Students had expressed concerns at the beginning of the course because there were not sufficient learning tracks to select from as they had expected. They shared that they would have liked to have at least one learning track per content area at the beginning of the course so that they could focus on a topic of their interest throughout the course. Students also mentioned that they could see a clear structure for each learning track and how each component (overview, explore, reflect and critique) led to the final project. The connection among concrete knowledge, reflection, critical thinking, and application made sense to students as new learning tracks became available. This was shared by students during the live webinars where they commented on how they could relate the topics of the projects to their own work and see how the components of each learning track were related to and built upon each other. Without doubt, students responded to a new experience with a new way of learning that directed their success in diverse ways. Students were able to understand that learning does not have a beginning or an end, but rather it is a cyclical process in which every stage builds upon the other. Furthermore, we think that the learning experience of these students was connected to real-life contexts and also was influenced by perspectives from others involved in the learning process.

Projects: The hands-on/application activities

To complete the experiential learning cycle in this course, a student must apply content knowledge to a project. Each set of learning tracks led to one project, for a total of four projects in the course. We designed these projects to challenge students to go beyond their comfort zone, take risks, and grow in confidence while integrating technological resources appropriately in their work. For example, the project for the problem-solving track asked students to:

> *"Make an impact on a national or global problem. This work must be completed using technology (online or with tools) and in a global community (communication and collaboration). I do not expect that you will solve the*

problem, but your impact should be quantifiable. For example, by spending time in the protein folding game Fold.it, you can earn points and work on team to design virtual proteins that help the medical community. Games are only one avenue, there are many different global communities working to make a difference through technology"

We also considered teamwork for the projects as a way for students to build their collaboration skills and enhance their interaction with peers. At first, some students struggled to conceptualize how they could complete the assignment and work collaboratively. Later, students realized that the projects reflected activities they would likely do in their professional practice. Although the scope of the projects and requirements seemed broad, there was room for students to bring their own experiences, connect the content studied to the project, and engage in collaborative learning. Further, whether students needed more practice with a technological application or refine theoretical approaches in their projects, they could have the flexibility to improve their work leading to more quality by reworking and resubmitting their projects. For instance, a group of students had difficulties with their social media project because they were required to use the social media application Twitter. They found it challenging to use due to a lack of knowledge about setting up an account, posting messages, and using hashtags. Eventually, they were able to engage in a process of learning by doing, leveraging their work to a better reflection in their assignment report.

During the face-to-face session at the end of the semester, students shared with the whole class their favorite projects from the four they completed over the course of the semester. Some students provided positive ideas about the flexibility and self-pacing of the projects and how they reflected on activities for real people and with real people. These students expressed that they liked the flexibility of selecting their own project because it gave them an opportunity to explore their interests in more depth. For example, many students completed the projects in their own workplace, engaging with colleagues and K-12 students. Some students chose personal aspects to explore and discuss within the constructs of the assignment. Besides, they found the self-pacing of the project appropriate because each student was able to establish their timing and to advance their work according to their own schedules.

In contrast, their recommendations included more open options for projects so that students could propose their own projects, establish better connection with gaming elements, work on the same project from a different perspective, and work on a project regardless of the number of tracks completed. These suggestions gave us a sense that students engaged actively in their own learning process, reflected on the content studied, used research strategies to gather information, and demonstrated high levels of critical thinking and reflection.

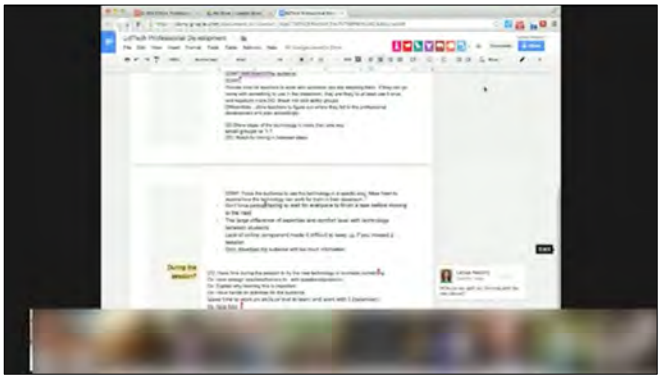
Central Hub

In order to promote communication among students as well as between students and the course instructor and teaching assistant, we developed what we called a Central Hub, which served as a communication platform for students to share concerns about the course content and assignments, find partners for their projects, and share ideas and insights about the content material. It was also a space for us to provide feedback, support, and guidance in the course flow. This space or learning hub was conceived as the center of broad and diverse perspectives where, through live webinars and a discussion board, students were expected to actively participate and engage in critical discussions, share and construct knowledge, and create a community of learning for learning (see Figure 12).

In order to hold the introductory session within the course, we hosted the first live webinar through the instant messaging and video chat service platform Google Hangouts. This platform offered a way to connect with students synchronously and share information live. During the introductory session, we presented the structure, dynamics, and content of the course. At first, we explained the course structure and how to access the different resources on the LMS. Students seemed engaged in participating in the webinars because this option allowed them to connect with others in the course, including the instructor and teaching assistant. Despite being a useful platform, Google Hangouts allowed only ten live video feeds, which in turn limited the number of students we could have on video and voice chat synchronously. Despite this limitation, we considered this platform as the most common and accessible resource for students because it is accessible through a Google email account, which most students already had. In order to balance the number of students who participated, we suggested students to take turns in the live portion of the webinar so that everyone could have an opportunity to interact with the instructor at some point. Our suggestion was well received by the students, and we could see different people live while others participated in the synchronous chat. As the course progressed, the new feature for live Google Hangouts, *Questions and Answers*, was used. Those students who were spectators of the live webinar via YouTube broadcast could post questions and get immediate feedback from the instructor or other students via audio or text chat. Nonetheless, we faced challenges related to poor Internet connection and inconvenient webinar schedule. To overcome these challenges, we recorded the webinars and posted them online using the course YouTube channel so that students could view discussions at a later time.

Leadership: Participants evaluate and reflect on current research and professional practice on a regular basis to make effective use of existing and emerging digital tools and resources in support of student learning.

LIVE WEBINARS



DISCUSSIONS

Forum	Description	Total Posts	Total Participants
General Forum		61	20
How People Learn		27	13
Problem Solving		21	12
Digital Citizenship		74	20
Creativity		24	14

FIGURE 12. Internal structure of Central Hub with discussion forums and collaborative work spaces.

Forum: Digital Citizenship

Organize Forum Threads on this page and apply settings to several or all threads. Threads are listed in a tabular format. The Threads can be sorted clicking the column title or the caret at the top of each column. More Help

Create Thread | Unsubscribe | Search | Discover Content | Display

Tread Actions | Collect | Delete

Date	Thread	Author	Status	Tags	Unread Posts	Total Posts
12/3/14 9:43 PM	Gaps leading to digital divide		Published		3	3
11/20/14 9:59 PM	Social Media		Published		2	3
9/5/14 2:56 PM	Working in Groups		Published		15	16
9/4/14 5:20 PM	Questions about video assignment		Published		2	4
9/3/14 4:29 PM	Favorite CC or Public Video Place		Published		0	1

Thread Actions | Collect | Delete

FIGURE 13. Discussion board for students' interaction.

Our vision was to use the live webinars as a venue to discuss topics and engage students to share experiences, knowledge, and concerns about the readings. These live webinars also served as the venue for consultation on projects and discuss course requirements, content, and details. For example, during the first live webinar, students expressed their concern about the absence of deadlines for their assignments and being unclear about the connection between learning tracks and projects. The instructor provided students with explanations about the approach to the course, how the activities were planned, and what expectations were set for the course. Further, we considered live webinars to promote leadership and active participation. We wanted to hear students' interests and perspectives on several topics; therefore, we encouraged students to select topics for further discussion at future webinars late in the semester. This activity enabled students to become co-participants in and owners of their own learning. These topic-specific webinars exhibited active interaction and discussion among students.

Moreover, the second activity in the Central Hub was a discussion board. We set up six discussion forums, one per topic, one for News and Updates, and one for Practice Area (which students did not use at all). We encouraged students to post their ideas, insights and resources in the discussion forums as soon as they worked on the overview and explore components for each learning track. These two components were intended to provide students with resources that introduce them to the topic and have them explore technological and theoretical resources. Students posted their ideas from this first exploration and engaged in conversations with their peers (see Figure 13).

We considered that the discussion forums would give students ample opportunity for constructing knowledge together and learning different perspectives on the topic. We could see how students in this course were building their own system of support as they shared resources and information they found valuable to their own learning. As the discussion forums grew with students' contributions, we also could see their progress, particularly in the different paths each student took – some students chose a learning track in the problem-solving content area, others chose a learning track on how people learn, and so forth.

In summary, the course included several design changes to assist in student organization, learning, and personalization. The course began with an orientation module that included course resources and requirements. The structure of the course was organized in four content areas, each with three learning tracks that included several related technologies. Each path for the student followed the experiential learning cycle, including (a) exploring, (b) reflecting, (c) critiquing, and (d) applying the new information. Regardless of the chosen technology, each track led to an open-ended project on the topic.

FINAL REFLECTIONS

This design case demonstrates our research-based approach to customizing students' learning experiences in an online course. Experiential learning, along with the application of a few gaming elements, brought to the course the flexibility and personalization that fostered the learning growth we were eager to see in our students. Through the re-design of the course, CI 505: Introduction to Technology in Teaching and Learning, we were assured that our students embarked on a learning journey with multiple opportunities to face concrete experiences, reflect on their understandings, conceptualize the content more clearly, and apply knowledge and skills in real-life projects and problem-solving activities. Through the few gaming elements we had added, our students also benefited from the flexibility and openness to select learning paths that fit their needs and interests. As evidence of the success of the design changes, student evaluations of the course instructor for Fall 2014 indicated a mean score of 4.4 out of 5.0. Student comments in the evaluation demonstrated engagement with the design (e.g., being able to choose which path I wanted to learn on) and satisfaction with the course (e.g., I really did enjoy working at my own pace and having open-ended projects and reflections).

Notwithstanding, this innovative approach to course design and development had its challenges. On the one hand, students were expected to take ownership of their own learning by selecting and navigating through learning paths that required ample flexibility; students were making their learning happen. It seemed in this particular design case that our students' struggle – to understand the course approach, scope, activities, and rationale – was linked to traditional teaching approaches in which instructors tell students what and how to learn. Our students needed a high level of support in order to feel comfortable with a non-traditional approach to teaching in our online course. With the right level of student support, including providing opportunities for one-on-one coaching and whole group interactions, we were successful in creating a positive experience for even the most resistant students.

On the other hand, the design of this course challenged our experience and expertise with technology and teaching. We also developed our own learning trajectory in the exploration of content, resources, and technologies for the course. This led us to move beyond our own comfort zones to create innovative opportunities for students to experience learning in a meaningful way and to connect this experience to their own professional careers. Further, in regard to knowledge, despite feeling confident about the topics and types of activities included for every learning track, we urged ourselves to dig deeper into the content. We built the reflection and critique sections in each learning track so that assignments would go far beyond mere comprehension and recollection

of information. We also designed these two sections to demand a high level of critical thinking from our students. For example, the critique sections in each learning track had catalyst questions to elicit students' analysis, synthesis, and appraisal of information along with a reflection regarding the learning experience in the course. Creating these catalyst questions was a challenge because we wanted students to engage in deep reflection and critical thinking for each topic studied.

Furthermore, although the components in every learning track were the same, the academic requirements varied. Most of these did not include right or wrong answers but instead required students to interpret information and engage in a critical analysis of each topic. Since the learning tracks were being developed while the course was in progress, the process put pressure on us to look for up-to-date resources that could enhance students' learning gains and professional goals. However, this benefited us because we were learning new insights in the topics while designing the course. In order to provide students with these resources, we discussed what type of resources were needed, which sources were appropriate, how to determine how reliable the resources were, and so forth. We also found ourselves immersed in a learning experience: making decisions based on student feedback, our own pedagogical perspectives, and our own teaching experiences.

As for our expertise, we felt challenged when incorporating technological tools on the go. We used many of the tools in the LMS, and some other external applications (e.g., Google Hangouts). We considered ourselves to be highly competent in using these tools; however, we discovered that technical troubleshooting was difficult to resolve promptly. Several of our students experienced unexpected technical difficulties, including searching for tutorials on how to use the video recording feature in Video Everywhere and integrating videos into assignments in the LMS. We decided to add links to these tutorials in the discussion threads, which students could use as a troubleshooting resources. Additionally, we engaged ourselves in investigating deeper other technical difficulties and providing students with solutions via email or messages within the course page.

Additionally, our own teaching experience influenced our belief that flexible scheduling would be an incentive for students to not feel pressured by deadlines. Students seemed to like being given flexibility, but they requested a broader range of learning tracks so that they could have more choices. As a result, the pressure shifted to us to develop learning tracks more effectively and rapidly. We gathered and selected the necessary information to create the learning tracks and then released these immediately. As experiential learning highlights a myriad of learning territories (Kolb & Kolb, 2009), thus, we were enhancing students' learning through instructors' learning. The redesign of the course through the lens of experiential learning and elements of game-based learning had given us a frame of reference in which different learnings have taken place; student's and instructors'.

In order to address challenges from the course as well as continue to improve the design of instruction, the following two changes will be implemented in the next course offering: (a) one content area with three tracks will be released every few weeks to reduce the amount of information presented as well as keep all learners together on projects, and (b) regular communication will move from synchronous webinars to an asynchronous discussion tool. We will continue to allow self-selection of learning tracks and flexibility of due dates.

Lastly, with this design case, we strongly believe that we have enriched our learning about course design, learning approaches, and the importance of coordinating efforts to create a learning environment that goes beyond the accomplishment of course objectives. We have grown in our understanding of individualized learning, its benefits and challenges, and the requirements to make feasible an online course that connects formal learning with real contexts. Our partnership in this design case has added great value to the learning experience of our students and has revealed how to incorporate into the course the instructor's view on teaching and the teaching assistant's view on learning. Rather than evoke a supervisor-student relationship, our work resembled that of a team with responsibilities and roles that supported each other. We see this design experience as a journey into our own thought process in which we engaged while making decisions intended to enhance the learning experience of our students. We have become more reflective and thoughtful in the process of designing a course, and the decisions involved seem to impact students' learning greatly.

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