

Implementing Authentic Tasks in Web-Based Learning Environments

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The instructor's inclusion of authentic activities improves the quality of student interaction and learning in online classrooms

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Students studying a computer simulation of global warming share ideas about factors influencing global temperatures. They vary the amount of greenhouse gases emitted by vehicles and factories or manipulate the quantity of green plants in the simulation. They observe that reducing industrial emissions or adding trees to the environment makes global warming less of a threat.¹

This scenario describes students collaborating to carry out an authentic task, in this case reducing global warming. Under the influence of social constructivist learning theories, many educators have become interested in students' active construction of meaning grounded in their own experience.² To support the construction of meaning, students need to interact with one another in accomplishing authentic activities in social contexts similar to those in which these activities will actually be used.³ Peer interaction can enhance the construction of meaning and advance students' intellectual growth.⁴

Innovative instructors have implemented authentic activities in physical classrooms for decades, and advances in Web technology make the use of authentic activities in fully online or blended courses increasingly feasible. The Web enhances access to experts and real-time data and enables multiple forms of communication among collaborative teams of learners.⁵ Many higher education instructors (as well as K–12 teachers) are becoming interested in using authentic activities in their online teaching. Before they can do this, however, educators must acquire confidence in the efficacy of the approach. They may even need to develop new mental models of what it means to teach. They can start by formulating individual answers to fundamental questions, such as the nature of authentic activity.

What Is Authentic Activity?

Merriam-Webster's dictionary defines *authentic* as genuine and real.⁶ Lebow described authentic activity as "experiences of personal relevance that permit learners to practice skills in environments similar to those in which the skills will be used."⁷ Brown, Collins, and Duguid described authentic activities as the "ordinary practices of the culture."⁸ According to Newmann and Wehlage, authentic activities are real-world tasks that a person can expect to encounter on the job, in the home, or in other social contexts.⁹

An important implication of these definitions is that authentic activities have the potential to foster meaningful intellectual accomplishment and learning, since authentic learning activities are directly related to students' real-life experiences.¹⁰ Students at every level commonly complain that they do not perceive the relevance of the academic learning tasks assigned.¹¹ If the learning tasks are authentic, then students can make direct connections between the new material and their prior experience. They can also apply the new learning to their current practice and future activities.

Characteristics of Authentic Activity

In describing the characteristics of authentic activities, different scholars have delineated them in different ways. Herrington, Oliver, and Reeves conducted a rigorous literature review related to these characteristics and identified 10 key characteristics of authentic activities.¹² Authentic activities

1. Have real-world relevance.
2. Are ill-defined, requiring students to define the tasks and subtasks needed to complete the activity.
3. Comprise complex tasks to be investigated by students over a sustained period of time.
4. Provide the opportunity for students to examine the task from different perspectives, using a variety of resources.
5. Provide the opportunity to collaborate.
6. Provide the opportunity to reflect.
7. Can be integrated and applied across different subject areas and lead beyond domain-specific outcomes.
8. Are seamlessly integrated with assessment.
9. Create polished products valuable in their own right rather than as preparation for something else.
10. Allow competing solutions and diverse outcomes.

Authentic activities that encompass these 10 characteristics facilitate group work. Within a learning environment built around authentic activities, students have their own roles similar to those found in a real-world team at work, at play, or in other collaborative social contexts. The instructor acts as a coach and facilitator, supporting students as they accomplish authentic tasks.

Authentic Activity and Web Technology

Technology has been used to support both learning and teaching for a long time, albeit with limited success.¹³ Despite a less than stellar history of effective usage in education, however, technology appears to have great potential to support student performance of authentic tasks and their resultant learning.¹⁴ Before the widespread diffusion of computers and Internet technologies, it was much more difficult—and in some situations even impossible—for instructors or instructional designers to use authentic activities in real-life settings because of the limitations of the subject matter, time and finances, and practical constraints and risks of physically moving students to fields of practice.¹⁵ With the development of Web technology, such limitations have eased.

A Web-based learning environment (WBLE), if used effectively, allows, enables, and promotes constructivist learning using authentic activities.¹⁶ The Web offers access to an enormous amount and variety of information, including dynamic data and visualizations of complex phenomena. Instructors can provide students with access to information about research results, practical simulations of complex phenomena, and other forms of real-world or simulated data. The information can be presented in almost any form, such as text, graphics, audio, video, and any combination of these.

Of course, information is not sufficient for learning. Students must be challenged with authentic tasks that drive the need to use, transform, apply, and reinterpret that information. Students can conduct exercises, play instructional games, and engage in high-fidelity simulations or other forms of virtual reality experiences on the Web. By transforming information into various forms such as audio and video and engaging in collaborative experiences, students can construct their own meaning and develop robust skills related to solving complex, ill-structured problems.

As noted, most authentic learning tasks encompass team work. Fortunately, communication programs such as e-mail, bulletin boards, and the other interactive tools found in commercial or public-domain course management systems allow learners to discuss problems, debate issues, and exchange information regarding task completion and related activities. In asynchronous situations, especially, students have increased opportunities for reflection and exploration of issues before they respond to a comment or query. Also, the instructor can provide individual or group guidance, advice, coaching, and

feedback through the various communication tools.¹⁷ Because of these advantages, more programs are starting to employ Web-based authentic activities, such as physical oceanography¹⁸ and global warming.¹⁹ In these projects, students participate in scientific investigations conducted jointly with other students and experts online. Herrington et al. used online authentic activities for a graduate certificate course in online teaching and learning, for example.²⁰

Authentic Activity and Meaningful Interaction

Merriam and Caffarella argued that the success or failure of online learning depends on the level of interaction occurring within a learning environment.²¹ They also believe that use of authentic tasks can be a powerful factor in ensuring such interaction.

The use of authentic tasks is derived from social constructivist principles of locating learning in the context of reality.²² Authentic tasks can foster learning transfer because collaboration among students not only helps them learn the concepts under discussion but also exemplifies how these concepts are used in real-world contexts.²³ In the 21st century, few knowledge workers labor in isolation; even though team members may be separated by thousands of miles, they accomplish their tasks collaboratively. To achieve a challenging authentic task, students must interact—sharing their thoughts, relating their ideas to past experiences, collaborating with their peers, actively constructing their own meaning, and incorporating the diverse perspectives of others.²⁴ Social constructivists believe learning can be enhanced through these types of interaction.

According to the theoretical principles of social constructivism, well-designed and well-operated courses focused on authentic activities should meet the expectations of meaningful interaction that contribute to student growth and learning.²⁵ Even though this sounds good in theory, instructors who want to use authentic tasks for their own courses may still ask themselves, "How can we design an authentic task in our subject area? How can we facilitate the process of task accomplishment? What kind of challenges will we face when using authentic activities? How are other instructors using authentic tasks?" Most instructors need some field-related information and a clear picture of how to design and use authentic tasks in real courses.

In an effort to provide such a picture, this article presents two Web-based learning case studies on using authentic tasks. The instructors who designed and managed these two courses offer several suggestions for implementation of authentic tasks in online courses. The information presented here pulls from an analysis of the transcripts of the discussion board postings and chat room exchanges in the two courses and on in-depth interviews with the two Australian instructors and with seven students who participated in the courses.

Case Study 1: Instructional Design Course

The first course was a 13-week master's level course offered online by the University of Wollongong (<http://www.uow.edu.au/>) in Australia. Twelve adult part-time students working as either teachers or instructional designers enrolled. The course was delivered mostly online through the Janison learning management system (<http://www.janison.com.au/>), accessed through the university Web site. This online course was totally asynchronous.

Task Design

This course gave students opportunities to learn professional knowledge and skills related to instructional design, especially in the context of designing online learning environments. The structure of the course afforded students ample opportunities to share information, present and critique each other's work, discuss course-related issues, design their own products, and reflect on the instructional design process.

The course design centered on three main tasks. Task 1 required students to explore media interpretations of classroom instruction in order to reflect on instructional design principles. Students chose a movie or television program that incorporated classroom scenes set in a school or university. They analyzed the assumptions the teacher in the film or episode made about how students learn and how the instruction illustrated those assumptions.

Task 2 required students to use instructional design concepts to create a product that could be used for teaching or learning about instructional design. For this second task, four groups of three students each collaboratively designed and produced a Web site, a presentation, or a booklet. Each product introduced and explained some history of at least three different instructional design models and provided an example of a lesson plan or learning environment that exemplified each model based on the team members' own experiences and research.

In Task 3, students individually applied instructional design principles by designing and producing a Web-based learning environment on a topic relevant to their current teaching or interests.

Process of Task Accomplishment

This description focuses on the group completing Task 2 that provided sufficient data for an "information-rich case."²⁶ Students mainly met in a dedicated discussion forum to accomplish task 2, and all 152 postings were associated with that task. We analyzed 75 postings (12,039 words) from the selected group.

The students "met" online with their own groups, which the instructor created based on the students' interests. They selected one task among options based on their interests and abilities. Then, they started defining the task in a detailed manner. They discussed the task and how it could be accomplished. Based on their understanding of the task, they divided the responsibilities according to each person's experiences and interests.

To collaborate effectively and clarify their individual responsibilities, they also made a timeline. As part-time students with full-time jobs, they were careful to avoid interfering with their professional responsibilities.

The group we studied most closely began by sharing individual resources and individual research results. Sometimes they disagreed about how to put together the individual research results for the final product. When this happened, they tried to resolve the issue by clarifying the original task again. When a second disagreement arose, however, they consulted the instructor. After solving the discord with the instructor's support, they built their final product and shared it with the other groups.

Learning Outcomes

All three students in the group admitted that although accomplishing authentic tasks through online collaboration was difficult, it was valuable. One of the students reflected at length on the experience: She felt this type of learning suited her after she became more confident in the new learning environment. She expressed the belief that the learning that occurred in this authentic learning environment permanently influenced the way she learns and how she feels about teaching and learning. She also suggested that while difficulties in applying authentic learning exist, students who apply themselves and overcome these difficulties would find authentic learning to be a rewarding experience.

The instructor had no doubt that the students achieved an enormous amount by accomplishing the tasks through online collaboration. In particular, three groups of the four delivered usable, impressively high-quality work. She concluded that the students, although challenged by the demands of the online course, had learned a lot. Unfortunately, differing expectations and discord among the members of one group prevented them from completing the collaborative tasks.

Case 2: Online Learning Course

The online learning course was also a master's-level course offered online by University of Wollongong for 13 weeks from July to October, with 14 adult part-time students who were also working as teachers, instructional designers, or Web developers. Interaction among students and instructor primarily took place through synchronous and asynchronous communication. Synchronous Web-based communication mainly occurred in the chat room at regularly scheduled times. Asynchronous Web-based communication was supported by discussion forums and e-mail systems that allowed participants to discuss various topics throughout the course.

The synchronous interaction yielded 2,515 postings with an average of 16 words each. The asynchronous discussion produced more in-depth interaction, such as sharing professional knowledge and discussing specific topics, including online copyright issues and the role of a professional Web developer. The asynchronous interaction produced 178 postings with an average size of 118 words.

Task Design

In this course, students created a prototype of a network-based learning environment in response to a real syllabus statement and a client brief. The course structure centered on three subtasks needed to fulfill the requirement.

Task 1 required students to observe and report on a network-based learning environment in which each student actively participated as a learner, a designer, a teacher, or a contributor. The report had to include recommendations for improving the system's effectiveness and for increasing opportunities to implement different learning activities.

Task 2a required students to develop a design statement outlining the conceptual design of a three-week learning project in line with the syllabus statement and/or client brief. Task 2b required students to implement a prototype of the three-week network-based learning project based on the design statement developed in Task 2a, while allowing for design revisions in the process. This environment was developed within Janison Toolbox or another learning management system of their choosing.

The first task allowed the students to explore an existing network-based learning environment, ask questions, think about it from a technical and pedagogical perspective, and synthesize their reflections in a report. The second task required the students to think about network-based learning in terms of what they had read and seen, and to represent their new knowledge in a design statement. The third task was the most authentic in that it required the students to put their design statement into practice by actually building and developing a network-based learning project. The design statement allowed them to describe design principles, and creating the prototype allowed them to apply those principles.

Process of Task Accomplishment

Students began their online interaction with short greetings that included their work roles and their online learning experiences. Next they considered how best to connect the task of designing and developing a prototype to their work contexts. Even though they had the same general goal, each student selected his or her own client and context. To accomplish these individually assessable tasks, learners were encouraged to share their thoughts, individual resources, and task problem-solving processes.

During the course, synchronous online chats were scheduled weekly as question-and-answer sessions; the discussion board was used for more in-depth discussion. Students frequently shared the status of their tasks. Because they worked individually, they wanted to know how their peers were progressing to check whether they were falling behind. After completing their individual projects, they shared their reflections about accomplishing the task in particular and online learning in general.

Learning Outcomes

The four students who participated in the interviews said the tasks in this online course were more demanding than typical class activities such as lectures, reading, and exams. They believed the authentic tasks also fostered feelings of learning and achievement. One student said these types of tasks allowed him to reflect on what he was reading and to actually apply the principles to his online design. Another student said she experienced difficulty at the beginning of the course because she had to adjust to both the online system and a new learning style, but in the end she felt proud that she had succeeded.

Students not only felt a sense of achievement, but they also created a real, applicable product—a network-based learning prototype. This tangible and usable product encouraged them to conclude that all the interaction processes that occurred in the course, although demanding, were meaningful.

The instructor said she was very impressed with the high quality of the students' work, along with their motivation and dedication. She thought the task-based approach was more effective in prompting students to think deeply about the complexities of network-based learning than if she had simply presented content on a weekly basis. She concluded that the students came to "own" the products they created and that through this ownership, they became much more engaged with the content than they would have in a teacher-centered course.

The Instructors' Suggestions

The instructor of the instructional design course has designed and facilitated several courses based on authentic tasks in WBLEs and has conducted considerable research in the area. For the instructor of the online learning course, this was only the second course in which she had used authentic tasks online, but she has also conducted some research on online interaction. When they were interviewed, both instructors highlighted the importance of the instructor's philosophy of learning, considerations in task design, the challenges of management in operating such a course, and several tips for facilitation.

Importance of the Instructor's Philosophy on Learning

Both instructors emphasized that all task design and teaching strategies start with the instructor's beliefs about learning. Therefore, instructors considering integration of authentic tasks in their teaching should reflect on their own philosophies of learning. If they believe their students can learn best by solving a real-life task, then they should instantiate these ideas in their course design.

The two instructors believe that authentic tasks required their students to think about complex issues, not only in terms of the literature but also in terms of how the design would fit in their work context and what they believe is "good" pedagogy. In addition, the feedback and the reflections they received from the students indicated that the students found the course exceptionally challenging, yet they had learned through rising to meet that challenge. The feedback confirmed the instructors' belief in using authentic tasks for their courses.

Considerations in Task Design

At first, practitioners might doubt that they can design authentic tasks for their particular courses. As one of the instructors said, "The hardest thing is to design the task. How can you get a task to carry all that learning?" Despite the inherent difficulty in designing authentic tasks, both instructors suggest four strategies they have learned from their own experiences.

First, they mentioned the importance of continuous reflection and revision. In developing a task statement, instructors or designers must constantly ask themselves, "When are students going to use this knowledge? What use will it be in any real-life situation? What will they learn from the process of

accomplishing these tasks?" Based on the answers to these questions, the task statements must be continuously revised.

Interestingly, one of the instructors stated that the task does not always have to be a real case. She explained the term "cognitive realism," in which students imagine they are in a realistic situation and think and act as if the case were real.²⁷ According to both instructors, the important thing in designing authentic tasks is to think through how the tasks will allow students to learn everything required by the curriculum.

Second, instructors should look for resources to support the process through which students solve the tasks. If a specific resource is offline, the instructor needs to convert it into a digital version students can easily access online.

Resources need not come solely from the teacher; they can also come from students and cooperative experts in the subject area. Obtaining useful resources can increase students' motivation as well as the authenticity of the tasks.

Third, designing complex and open-ended tasks allows students to come up with their own ideas and make choices about their paths of action. They can not only assess how the task could be applied to their own work context but also how their prior work experiences could be applied to their understanding of the issues. For this to work well, however, instructors need to model best practices or provide examples that help students understand what is expected. Previous students' work or real experts' work can provide important models.

Fourth, the instructors suggested designing incrementally more challenging authentic tasks. For example, the first task might ask students to explore a problem and provide background information about the task. This also allows time for them to adjust to online learning and to the interface of the learning management system being used for the course. Each subsequent related task increases in complexity, so students experience "cognitive apprenticeship"²⁸ and "legitimate peripheral participation" of learners gradually being drawn into a circle of full expertise.²⁹

The Management Challenge

Any course involves challenges in operating and managing it, but managing a learning environment well is an indispensable skill for an instructor. In WBLEs using authentic tasks, the two instructors identified several challenges. In particular, they mentioned the difficulty of managing group work, the sensitivity and permanence of written interaction, and the relatively large workload.

Consider that in the instructional design course, one student group broke up because of disagreements. Their reluctance to communicate frankly made it difficult for them to work out roles and responsibilities for their task. Therefore, they never achieved deep reflection or substantial collaborative learning.

Although this was a negative experience for the students, the instructor also described it as a learning opportunity: the students had to learn how to collaborate at a distance and to negotiate individual roles within the group. Therefore, she suggested that instructors help students learn from any negative experiences. She also mentioned that effective group work requires good support strategies. She recommended putting one person with experience in online group work and in the topic area with people lacking as much experience because she thought the experienced one could provide leadership and help the online group work more smoothly.

Written interaction demanded more caution from the instructors than verbal interaction. When they replied to a student online, it took quite a long time to compose the message. Moreover, because a written record existed of the online communication, it was important that the message not be misinterpreted. Instructors cannot see students' facial expressions and thus have no cues as to how somebody is responding to feedback. Therefore, they must think very carefully about how the students would interpret their written words.

Workload is always an issue when teaching in an online learning environment.³⁰ Instructors can't escape the constant e-mail messages from their online students. In many cases, they can easily spend half an hour or more writing a response to a single query. To more effectively manage time, the two instructors suggested making a schedule for checking students' e-mails and discussions.

Another factor increases the workload in a WBLE using authentic tasks: preparation. Instructors spend considerable time thinking about and designing appropriate tasks, as well as collecting relevant resources. According to the two instructors' experiences, however, time spent in preparation saved time in implementing the course.

Facilitation Tips

Research shows that one of the worst aspects of online learning can be facilitators who do not know how to provide good facilitation.³¹ One of the two instructors said, "I think facilitation means just provide encouragement, support, and give them scope to think." The two instructors offered several tips for better facilitation.

First, they tried to participate regularly in students' interactions and to model appropriate online interaction. Even though most students are accustomed to Internet technology and online chatting, many still feel uncomfortable using it as a learning tool. The instructor's presence can reduce their anxiety by providing expertise in the online learning environment as needed.

Appropriate use of students' contributions and resources is helpful in motivating students as well as saving instructors' time. Students usually have valuable experiences to share. Peer support can make the course more meaningful and lead to more frequent interaction among students. The instructors suggested trying to connect one student's thoughts, interests, and beliefs to other students' communications and asking permission to share students' work with future cohorts. Peer examples are often both relevant and realistic for other students.

Regular updating of the Web site is also important for successful online learning. Instructors have to make the course Web site fully functional because everything occurs in the online space. The Web site becomes the central meeting point where students go to find out the latest updates for the course and to access reading resources and discussion tools for online interaction. The instructor should regularly post announcements and new resources so that students see the Web site evolving as a learning environment. This can increase students' interaction as well as their interest in participating in online learning.

Table 1 summarizes the two instructors' suggestions for practitioners who want to use authentic tasks for their own online classes. Find more information about authentic tasks in their environment at <http://www.authentictasks.uow.edu.au/>.

Table 1	
Suggestions for Authentic Tasks in Online Courses	
Considerations in Task Design	<ul style="list-style-type: none"> ■ Continually reflecting and revising
	<ul style="list-style-type: none"> ■ Collecting available resources through online and offline sources
	<ul style="list-style-type: none"> ■ Designing complex, open-ended tasks
	<ul style="list-style-type: none"> ■ Designing incrementally more challenging authentic tasks
The Management Challenge	<ul style="list-style-type: none"> ■ Difficulty of managing group work
	—Help students learn from negative experiences
	—Use students who have experience in online group work to help the group work well
	<ul style="list-style-type: none"> ■ Difficulty of written interaction
	—Before clicking the send button, make sure the content makes sense and that you are sending it to the right person
	<ul style="list-style-type: none"> ■ Comparatively high workload
	—Make a schedule to check students' e-mails and discussions and stick to it
	—The more time spent in preparation, the more time saved in operating the course
Facilitation Tips	<ul style="list-style-type: none"> ■ Participate regularly in students' interaction process
	<ul style="list-style-type: none"> ■ Serve as a role model
	<ul style="list-style-type: none"> ■ Share students' thoughts and resources
	<ul style="list-style-type: none"> ■ Update Web site regularly

Click image for [larger view](#).

Conclusion

Many theorists have advocated the positive influences of authentic activities in meaningful learning, supported by growing evidence of successful applications of authentic activities in online learning situations. Nonetheless, some aspects of using authentic activities remain unclear, and practitioners lack specific guidelines for their use. Even if practitioners agree with the beneficial effects of authentic activities on learning, they do not all know how to apply and manage such realistic activities effectively. They need examples of successes and failures and field-related information from real cases. Through reviewing such cases, practitioners can get a clearer picture of what is involved in applying authentic tasks to their curriculum, including learning processes and implementation techniques.

The two cases highlighted in this article and the two instructors' suggestions provide practical guidelines to practitioners, including instructors and instructional designers, who want to learn about and use authentic activities to improve the quality of interaction and learning in their online classrooms. However, more cases involving various subject areas are needed to build up an effective online pedagogy with authentic activities. In addition, the students in these two cases were adult professionals; the results might differ for college students from 18 to 24 years old. We encourage others who have experience in using authentic activities to share their experiences with the growing community of instructors teaching online.

Endnotes

1. This scenario is based on an example in R. Jackson, W. Taylor, and W. D. Winn, "Peer Collaboration and Virtual Environments: A Preliminary Investigation of Multi-Participant Virtual Reality Applied in Science Education," presented at the annual meeting of the American Educational Research Association, Montreal, 1999.

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