Active Learning: Engaging Students To Maximize Learning In An Online Course

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Abstract: Student engagement is key to successful teaching and learning, irrespective of the content and format of the content delivery mechanism. However, engaging students presents a particular challenge in online learning environments. Unlike face-to-face courses, online courses present a unique challenge as the only social presence between the faculty and the student is via the Internet. In a recent poll conducted by the authors, 100% of the respondents considered student engagement a challenge regardless of the number of years they have been teaching online. This paper explores various strategies that can be incorporated into the design of online learning courses to foster a high level of student engagement based on multiple pedagogies. In addition, the role of collaborative student engagement tools for the design and delivery of online courses is discussed as well as the role these tools play in creating an atmosphere where students actively participate in learning activities and are contributors to lively discussions. Perspectives on various mechanisms of student engagement that are founded in classic active learning pedagogies and enhanced with new technologies are presented in this paper, including perspectives on the design of courses to facilitate student engagement as well as best practices of design and delivery of online courses. Finally, this paper emphasizes the importance of deliberate course design in the pursuit of actively engaging students in online course settings.

Keywords: active learning, higher education, student learning, student engagement, online course design and development, interdisciplinary collaboration, frustrations

1. Introduction

Student engagement is not only a challenge in traditional face-to-face classrooms but also, and debatably more so, in online courses. Online course delivery faces additional barriers to engaging students not typically present in face-to-face courses including the fact that course design and development must occur before the actual delivery of the material, effective time and resources management is necessary on the part of both the students as well as faculty when online, methods of encouraging student communication and interactions amongst themselves and faculty differ greatly from face-to-face delivery methods, and the efficient implementation of teaching tools used to deliver the online course is a challenge for many faculty. However, many of these concerns can be addressed through the implementation of active learning strategies that encourage students to actively participate in the online course content.

Typically, active learning is not associated with online or blended learning environment. However, there are several strategies for effectively incorporating and practicing active learning in non-face-to-face settings including the use of well-conceived discussions, group work and creating a collaborative environment that encourages and fosters a community of learning. It is critical to weave active learning through the major components of an online or blended course, including discussions, assignments and assessments to promote a high level of student engagement.

The quality of an online course in comparison to its traditional face-to-face counterpart is the most critical issue that impacts the design and development of an online course (Haugen, LaBarre, & Melrose, 2001). Some of the key components in online courses are the design of instructional material for the content delivery, student assessment of material, discussion management, time management and frustration handling. However, this paper adds an important item to this list: student engagement. In this paper faculty from three different fields, Computer Science, Industrial Engineering and Engineering Management and Health Informatics, discuss the multidisciplinary approaches of design and development of the key components identified above for online courses, best practices in online course design and delivery and various

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mechanisms of student engagement they employed in online courses. These student engagement mechanisms are founded in classic pedagogies but adapted to suit the online course environment. This idea of applying traditional active learning methodologies to the online setting while retaining the function of actively engaging students in their learning will be central throughout this analysis.

2. Background on Active Learning

Just as in a face-to-face class, it is important to emphasize active learning in online courses. Allen and Tanner (2005) have described active learning as "seeking new information, organizing it in a way that is meaningful, and having the chance to explain to others" (p262). Studies have shown that employing such methods of active learning improves both students' learning and their attitudes towards learning (Vygotsky, 1978; Chickering, Gamson, 1987; Armbruster et. al, 2009). However, many faculty still face challenges when integrating active learning into courses. Experimentation and exploration in teaching and learning methods is required to develop and adapt unique teaching methods to a course - including those being taught online (Rogers, 2010). While this may require additional effort, it is an effort that must be made if students are to be actively engaged in their learning; regardless of the medium in which the course is being taught. For example, when active learning was incorporated into a college level physics course, understanding of the topics increased 40% to 60% in comparison to traditional teaching methods (Laws et al., 1999). Active learning strategies have been shown numerous times to promote student engagement and have a significant impact on student learning when implemented effectively throughout the course.

There are many mechanisms of active learning that can be utilized to enhance student learning. One learning model that has been core to the development of active learning strategies is Bloom's Taxonomy. In fact, Bloom's Taxonomy of educational objectives is one of the most widely used ways of organizing levels of expertise (Bloom et al., 1994; Gronlund, 1991). Bloom's Taxonomy defines three domains of educational activities: Cognition, Affective, and Psychomotor. Each of these domains identifies levels of expertise, which can be measured through knowledge-based goals, emotional goals, and skills-based goals (Bloom, 1969). Currently this methodology is most commonly used in the higher education setting in the knowledge-based goals. However, Bloom's higher order cognitive skills, such as application, analysis, synthesis and evaluation, demonstrate a deeper comprehension of material. These cognitive skills are strengthened through active learning strategies such as visual learning, cooperative learning, debates, drama, discussions, role-playing and peer learning/teaching (Bonwell & Eison, 1991). These activities allow students to direct their own learning, which is especially important in science disciplines because scientifically minded people are curious, constantly inquiring and are lifelong learners (Madhuri et al., 2012). According to Vonderwell and Turner (2005) "pedagogically effective convergence of active learning strategies and methods and technology tools can help faculty and students accomplish successful teaching and learning" (p66). This statement will guide our evaluation of online course delivery tools and methods that make material engaging and effective.

Integration of Active Learning into Online Courses

Integrating active learning into course material is crucial to engaging students, regardless of the environment. However, because of the unique nature and challenges of online courses, an understanding of the unique approaches to active learning is needed. In a recent survey conducted by the authors, 66% of the faculty and staff polled (n=29, and the number of responses for each question ranged from 23 to 29) have taught an online course. In the same poll 33% of respondents indicated that they had been teaching online courses between 3 to 5 years, while another 33% have been teaching between 6 to 10 years. Twenty-two percent and 4 % have been teaching for one to two years and ten years or more respectively. Of all respondents, 67% of the respondents have received some type of formal training for teaching online courses, including national level training, institute level training and education or a degree in online education while the rest of the respondents were self-taught. Of the surveyed faculty, 100% indicated that they were very concerned or somewhat concerned about student engagement in online learning. From this survey, it is evident that student engagement is a major concern for faculty and staff irrespective of the number of years they have been teaching.

Despite the apparent concern with student engagement demonstrated in this survey, a historic literature review shows a resistance to adoption of active learning methodologies (Vygotsky, 1978). Examination of the literature reveals that active learning has been promoted since the early 1980s. Seminal authors, Chickering and Gamson (1987) have stressed the need to engage students in activities beyond the traditional lecture

format. These activities should be based on higher level thinking, such as analysis, synthesis and evaluation of Bloom's taxonomy. However, the suggestion of doing activities beyond the traditional lecture to improve student engagement has met with resistance; instructors believed that students are actively engaged in the traditional lecture format. These varied viewpoints show a need for more understanding in this area. The recognition of the role student engagement plays in facilitating learning is a pivotal recognition and necessary starting point. However, this is not enough; this realization needs to drive improvement in course design to achieve active student engagement in all course deliveries. Various mechanisms for active engagement in learning and collaboration in online classes are explored below.

3. Strategies to Incorporate Active Learning in an Online Course Design, Development and Delivery

While the importance of active learning methodologies to improve student engagement has been thoroughly examined, the additional challenges faced by online course delivery changes how active learning practices are put into practice. A few aspects that should be considered with regard to online courses is the integration of design elements, accessibility of materials, value of interdisciplinary collaboration, development of community among students and faculty, encouraging valuable discussions and use of effective assessment methods.

The integrated course design models consist of the basic components of identification of situation factors, learning goals, teaching and learning activities and feedback and assessment (Fink, 2015). The proper design of these components is crucial to engaging students in an online environment. Poll and Weller (2014) outline six strategies to help develop best practice in the online environment (1) building a community, (2) clearly outlining course expectations, (3) utilizing online tools for interaction, (4) promoting the exchange of ideas, (5) providing timely and relevant feedback and (6) creating an environment that is student centred. According to the Pearson (2014) report "Implementing Comprehensive Online Learning Programs that Improve Student and Institutional Outcomes in Higher Education", 74% of academic leaders rate online education learning outcomes the same or better compared to face-to-face courses. This data supports the integration of these strategies to encourage student engagement within a virtual community.

The authors have utilized several tools and teaching principles to incorporate active learning in online courses such as Piazza, Poll Everywhere, debates, interdisciplinary collaboration and industry collaboration. These tools were found to actively engage students in the courses and improve learning. Emphasis was given to increase accessibility of the course materials to the students. The ability of students to access course materials and engage in the course activities while they are on the go is critical for the success of an online course. Additionally, integration of learning with other disciplines, and choice of application and assessment type all play a critical role in actively engaging students (Khan, 2011, 2012, 2013, 2014, Khan & Erickson, 2014).

4. Significance of Interdisciplinary Collaboration

In this global age, collaboration across borders and disciplines is a norm (Khan, 2011). The concept of multidisciplinary teams spread across geographic boundaries working together using technology has been very slow to be adopted in higher education (O'Brien, Soibelman, & Elvin, 2003; Kaufman, & Brooks, 1996). Students in a class are coming from various parts of not only the country but also the world; online courses provide an opportunity to build a rich environment of collaboration. Doing so not only better prepares students for their future careers, but also serves to engage students in their learning. Collaboration also takes advantage of the fact that groupwork has been identified to be beneficial to student learning in an online environment (Koh, & Hill, 2009). For this reason, it is critical to foster a collaborative learning environment where students from varying disciplines with different cultures and ethnicities can work together (Erickson, & Khan, 2014). For example, in an interdisciplinary project, undergraduate students from one of the authors' software engineering class collaborated with students studying Occupational Therapy to generate solutions for specific problems related to Occupational Therapy. This sequence of software engineering undergraduate courses (two consecutive semesters) utilized the concepts of interdisciplinary collaboration to engage students in real-world scenarios to engage and foster learning. The software engineering students were required to follow the principles of software engineering design and development to develop a software application. In this collaboration, the Computer Science students met with the Occupational Therapy students worked together in first identifying a problem in the Occupational Therapy field that could be solved using technology and came up with a design of an application to serve as a solution to the identified problem in the first semester. In the second semester, the students coded the application based on the principles of software

development. This provided a rich collaborative learning environment where students were discussing various real-life problems and their solutions. Students were asked to rate their proficiently in hard skills such as requirement elicitation or product design before and after the course. After completing the course, students ranked their proficiency in hard skills, such as requirement elicitation and product design, higher (Khan 2012). Soft skills such as communication, teamwork, rules of professional engagement, presentation and respect for diverse viewpoints were practiced in addition to the technical skills related to their professions (Khan, 2013, Khan & Erickson, 2014). Students self-reported a significant improvement in soft skills. In particular, students commented on increased ability to prioritize needs, think critically and interact professionally. After utilizing this interdisciplinary teaching methodology for three consecutive years, similar improvements have been reported in hard and soft skills each semester. In addition, the relevant real-world experience from this course sequence better prepared students for the transition to the workforce (Khan & Erickson, 2014). Because of these successes, we propose this as an example curriculum for engaging students in meaningful interdisciplinary activities.

Although higher education's organizational structure creates boundaries between disciplines, interdisciplinary collaborations foster "innovative integration of multiple fields of study" with far reaching goals and outcomes (Newell, 2010). The key is to foster collaborative learning with contemporary issues. This allows for interaction with different groups including the community. This type of setting allows for experiential learning through a social and cognitive process. It enhances critical thinking skills, collaboration and self-reflection. Newell (2010) identified the importance for students of experiencing integrative learning to be prepared for a complex world. This type of curricular approach would ideally prepare students to understand complex situations through a comprehensive perspective. Successful academic & industry collaborations can enhance use of technology, cross-disciplinary work, and establish a community atmosphere within the course participants. For colleges and universities, it has an underlying potential to enhance recruitment, research or scholarship. Specifically, experiences can strengthen skills of faculty by keeping them current with industry expectations and informs curriculum development. For students, well thought out collaborations can provide real hands on experience, strengthen course engagement and even provide an opportunity for jobs.

Where do you start? Find a common ground. Identify an area that is mutually beneficial, or where training is needed. Search for grants that support the objective at hand. It is important to identify a champion from both the college and the industry. Most importantly, be creative!

5. Accessibility of Course Materials

Student engagement in online courses is very much dependent on students' ability to access the material. Mobile eLearning applications increase accessibility to the course materials. Mobile learning is considered an extension of online technologies and is largely dependent on cloud-based services to eliminate the resource restriction of mobile devices (Bonwell, & Eison, 1991). Mobile learning provides students with access to course resources while on the go and is designed to allow real time access to the online course via mobile devices. While mobile learning has advantages, it also has its challenges (Khan, 2014). The advantages are that it provides access to learning anytime and anywhere adding accessibility to learning. Most learners have some sort of mobile device and having access to learning while on the go increases the chances of success. The challenges are that the mobile devices have limited resources such as viewable area, limited memory and processing power. Employing cloud based mobile learning eliminate the restrictions of memory and processing power (Alexandru, Nicolae, & Loredana, 2013; Laouris, & Eteokleous, 2005). There are a variety of student cantered mobile eLearning strategies such as the accessibility of course content that is faculty created as well as student created, in-class and out-of-class connection, assessment and self-assessment, tools that would facilitate student interaction, communication and collaborations (Martyn, 2007; Vygotsky, 1978). These tools provide increased access to course material as well as more ways to interact with classmates and faculty within the online environment.

6. Creating a Community of Learning

One of the most important components of online learning is to provide a forum for the development of a community. It is very important to have a statement of clear expectations of the students and the instructor at the beginning of the course. One way to provide expectations is through the use of a recorded welcome to the course. This allows students the opportunity to virtually meet you as you set the tone for the course. A welcome page describing where to find course materials and well-defined expectations for the overall course

as well as each assignment is key to setting the stage for student participation and engaging students in the course.

It is essential for the students to feel comfortable and valued in the course to be actively engaged in the activities of the course. Creating activities that engage students in critical thinking and thinking outside the box help create a community of learning (Hylton, 2007, Khan, 2014). Students can encourage each other by participating in the various activities. Discussions offer a great opportunity to design activities that increase student ownership and participation in the course. As was previously touched on, activities such as debates, role-playing, drama, and peer learning/teaching are valuable tools for increasing student engagement in the discussions. Students can create video clips of debates, drama, role-playing or peer teaching and post in the discussions to share with the class. Various modes of engagement such audio, visual and scripting can be used to facilitate discussions. Furthermore, the syllabus plays an important role in defining a relationship between faculty-students and the peers. Hence, the syllabus should identify overall course expectations, course schedule and when and how an instructor would provide feedback to the students. Another way of creating transparency in the faculty students- relationship is by the use of rubrics. Rubrics allow for clear articulation of the assignment expectations by guiding the students in overall performance and provide standardization.

Another significant piece in the development of a community of learning in an online course is communication. Communication in an online course is a critical component in the exchange of information in verbal and written forms. Most communication is in the written form and hence the writing skills and the ability to communicate thoughts through written messages are critical (Haugen, LaBarre, & Melrose, 2001). Interaction and communication between the students and between students and faculty is one of the most important elements of online learning (Kearsley, 1997). Kanuka et al compared various modes of communication and found the debate as one of the modes of learning where students had the most cognitive presence (Kanuka, Rourke, & Laflamme, 2007). The key is to not only require class participation within the course, but to promote styles of participation that engage and add value to the course.

7. Engaging the Classroom Through Discussion

A growing body of literature has shown that discussions are beneficial for promoting student engagement and developing critical thinking skills. Other benefits of discussion include improving communication skills (Dallimore, Hertenstein, and Platt, 2008), and enhancing students learning (Hamann et al. 2012; Huerta, 2007). Furthermore, active learning can be incorporated in discussions in online class settings. In an online course, discussion is an important component that can determine the success of the course. Simply put, the success of online discussion largely influences the effectiveness of online courses (Maddix, 2012).

It is critical to provide an environment in online classes that allows a high level of discussion, which at the very least is similar in quality to discussions that take place in a face-to-face classroom. However, discussions that take place in a face-to-face classroom do not always translate to an online course. Some benefits of online discussions over classroom discussions include convenience, additional time for students to reflect on discussion prompts and responses, increased participation and a greater sense of community (Dixon, 2014). Furthermore online discussion allows instructors more time to interact with students without the time restriction imposed by face-to-face-classes.

Dixon (2014) proposes three elements to be considered for online discussions to be successful including pre assessment, relevance and assessment criteria. Pre-assessment involves finding out what students already know about the subject so that instructors have a better idea of an appropriate point from which to start the discussion. Relevance refers to how the material being covered pertains to the students. It is important for students to know how their learning applies to them or how it can be used in a real world setting. Finally, assessment criteria need to be clearly stated so that students know what is expected of them. Well-defined and clear assessment criteria help in preventing surprises.

To encourage participation and learning, students need to be comfortable with the new material, be actively involved and be able to analyze the material. There are several tools and strategies to promote active learning and student engagement including using small groups, debates and assigning different roles to students in discussions. For instance, in a study by Reese-Durham (2014) each student in an online course took on the role of facilitator or participant for a given topic. This resulted in an observed higher level of student engagement

than witnessed in face-to-face-classes. Debates enforce content mastery, delivery, and communication of knowledge. One of the authors has used debate as a means to encourage students to not only learn their subject matter in-depth but also to communicate the knowledge they have gained to others. She identifies a variety of topics that lend to debatable concepts and asks the students to pick a topic they would like to debate on. After the students have picked their topics, she makes sure no more than two or three students choose a topic depending on how many facets of debate the topic lends. After the topics are selected and students know whom they are debating against, she assigns dates the debates will be conducted. The time allotted to each debate is between 15 and 25 minutes including the time for questions. If the class size is large, the students are asked to videotape the debate and then post the videos online for student viewing. Lastly, students have to complete short quizzes on each of the debate topics. The quizzes provide quiz provides a means of assessing the students who were not debating and the students debating are not required to take the assessment for their debate. This provides an avenue for increased learning by enforcing mastery of the subject the student is debating and knowledge of the topics of the debates they are observing. This has led to an observed increase in participation by students compared to watching a video or listening to a lecture.

Some tools for use in online discussions include learning management systems, video chat tools and discussion boards and forums. Learning management systems such as Moodle and Blackboard, host online classes and can provide a place for students to communicate with each other and with the instructor. In addition to learning management systems, some instructors choose to have an additional online discussion platform such as Piazza to manage discussions in the class. Lastly, video chat tools such as Google Hangout allow instructors and students to participate in discussions through video conferencing. Video chat solutions provide a variation to the more commonly used online discussion format that does not involve a video component.

8. Use of Effective Assessment Methods

The use of effective assessments methods is another important tool to support student learning and improve instructors' understanding of student needs (Vonderwell & Boboc, 2013). The manner in which students are assessed conveys a strong message about what is important and how students should approach an educational experience (Garrison, 2011). In an online course, the use of appropriate assessment techniques is important because of its physically remote nature compared to a face-to-face learning environment. Assessments in online courses may pose greater challenges in cases where instructors attempt to adapt the assessment methods used in face-to-face classrooms. Therefore, it is important to use assessment techniques suitable for online learning. As in face-to-face classrooms, both formative and summative assessment can be useful in online classes. Summative assessments provide a measure of the level of proficiency achieved at the end of a class or class unit. Formative assessment provides feedback that can be used by both the instructor and students to make further improvements in the ongoing course. Instructors need to use a wide range of assessment techniques and should avoid using redundant methods (Vonderwell & Boboc, 2013; Bloom, 1994). Bloom's Taxonomy provides a system to evaluate the curriculum, not only for assignments, as previously discussed, but also to evaluate assessments as well as to identify where content is introduced and how content grows in difficulty throughout the course. This is done by evaluating the outcome goals (whether it is knowledge, emotional or skill based) and comparing this against the goals of previous assignments to assure that goals are obtainable (not too challenging) and assessments are measuring concepts that have been expressed in previous coursework. In addition, this allowed for verification that content was introduced at a lower Bloom Taxonomy's level and that higher levels of Bloom's Taxonomy are introduced where appropriate over time. The most important question to ask when evaluating assessments is "does the content address the necessary level(s) where it was intended in the curriculum". In one of the authors' programs, a departmental group assessment process was created, where program-level outcomes were identified. The group then embedded these outcomes into relevant courses and individual assessments were designed to address the respective outcomes. This allowed the department to ensure content was weaved throughout the curriculum. Bloom's Taxonomy, can be used to ensure that assessments meet the educational goals of the course.

The American Association for Higher Education (AAHE) (1987) provides a set of best practice principles for assessing student learning. According to the AAHE, assessment should be viewed as a vehicle for educational improvement and is effective when learning is reflected as multidimensional and longitudinal; meaning performance is revealed through increasing growth over time. One way to achieve these aims is to provide a clear process for goals and objectives. This task requires a multidisciplinary approach to institutional improvement. The 11 key findings for best practices in assessing learning outcomes (Benchmarking Study,

Best-in-Class Report, 1998) supports this finding by recommending assessment plans should be strategic in nature. Meaning an incorporation into the culture of the organization and other ongoing performance improvement efforts. Ultimately, good assessment takes a continuous, systematic, and multidimensional approach (Leskes, A., et al., 2004).

Designing effective rubrics is key to successfully assessing outcomes in any course. The Quality Matters Higher Education Rubric, fifth edition, 2014 provides a set of general standards including course overview and introduction, competencies, assessment, instructional materials, technology, support, and accessibility to ensure students achieve the desired learning outcome. The overall goal of rubrics is to teach students that learning is their responsibility, and to encourage students to become self-reflective. This will help student visualize identified strengths and weaknesses. One way to accomplish this is to have students use the rubric as a self-reflective exercise before submitting an assignment. This not only strengthens self-accountability but it also helps to guide students in expectations of the assignment. A final note on assessments, polls are a great tool for engaging students in an online course and to assess how well students are learning concept. They can be administered quickly to determine student progress as well as being useful as a basis for follow up discussions. By doing so, students' engagement in course and progress towards course objectives can be quickly assessed and content can be adjusted as needed. By providing faculty a clear representation of student understanding, faculty are able to guide learning accordingly.

9. Challenges Facing Active Learning Integration in Online Courses

While many concerns in regard to student engagement in online courses have been discussed, one of the most prominent organizational challenges is the lack of recognition of the time that is needed to effectively design and administer online courses. Converting a face-to-face class into an online format can be a challenging process because online course development requires a lot of planning and specialized training (Cox and Egbue, 2014). Furthermore, a significant amount of time is required for developing an online course. The online learning environment creates many challenges that require patience, skills and experience in handling and overcoming. For instance, the bandwidth of the internet can cause the internet connection to slow down causing congestion and frustration for the faculty and students. Device incompatibility can cause problems with the access to the online instructional and assessment material.

In addition, frustrations can arise among faculty especially in cases where college administrators do not recognize the increased workload on the faculty. Furthermore, lack of resources including technology and personnel can cause dissatisfaction among faculty. The two most important factors that have significant impact on the delivery of online content are the technology used and the design of the course. (Kampov-Polevoi, 2010). Unavailability of resources adds to the time and effort required for both course development and management. Another frustration that can be experienced by both instructors and students is the resistance to interactive online instructional techniques. It is important to provide adequate resources and training, support from higher administration and outline clear goals and expectations in order to minimize agitation and resistance among faculty and students. If the students have not clearly understood their responsibilities and the expectations, this can cause resentment both on faculty as well as the students' side. It is important that both faculty and students are aware of their responsibilities and expectations. Not knowing how many hours of the work the student is expected to perform, the student may overestimate the faculty time commitment, while the faculty may underestimate the time she/he may require to facilitate an active discussion during online office hours.

10. Conclusions

Despite the challenges faced in developing and delivering effective online courses, participation in online courses is becoming widespread. Various mechanisms can be used in the design of an online learning environment that potentially foster a high level of student engagement. It is hoped that the utilization of these methods will become more prominent in online course delivery. However, it is important to recognize that, regardless of the tools being utilized, designing an effective online course involves careful planning, considerable resources and dedicated time commitment as well as experience and expertise in teaching and learning. A recent poll by the authors, show that faculty and staff involved in both the design and teaching of online courses are very concerned about student engagement. The level of experience of these faculty and staff ranges from 1 year to over 10 years. This indicates that student engagement is a concern that exists

regardless of level of teaching or experience and subject matter. Furthermore, student engagement is a process of continuous improvement and should be constantly revisited and evaluated.

From a faculty and student perspective, consistency in the design of courses is imperative for the success of a course. From a student perspective, when a student comes across courses with a similar design the navigation through the courses becomes easier. The student is aware of the delivery dates and the format of the course materials. From a faculty perspective of design and delivery of an online course, it is easier to have a consistent design to monitor quality of the courses. Inventing new ways to design courses requires research in the area of efficient course material delivery. Some best practices for online course development include using integrative course design with measurable learning outcomes, presenting information in a variety of ways, breaking information into appropriate segments, clarifying expectations, promoting active learning, and the effective use of discussions (Resources for Online and Hybrid Teaching - Center for Engaged Instruction, 2012). Although the fields of study of the three authors are different, they each bring their unique perspectives to the online environment. Sharing of teaching practices formally or informally can be helpful for all faculty in improving student learning. The online environment is different from the traditional face-to-face environment and hence the tools and teaching techniques used in the traditional face-to-face classroom cannot be directly applied to the online classes. These tools and techniques have to be modified to accommodate for the lack of physical proximity experienced in an online course.

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