Optimizing Learner Experience with Intuitive Asynchronous Online Discussion Design

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Introduction

Social presence is an important metric for assessing learner performance in online learning environment. Asynchronous online discussions provide opportunities for learners to collaborate and socialize with their peers and instructors at their own pace. Brown, Collins, & Duguid (1989) asserted that people learn while interacting with each other through shared activities. But, Hewitt (2005) found that online learners consistently have limited discussion contributions in asynchronous discussions. Many researchers have examined the factors that caused low discussion participation and motivation (Deng & Tavares, 2013; Hew, Cheung, & Ng, 2010; Vonderwell & Zachariah, 2005). Besides learners’ personality traits and instructors’ pedagogical strategies, technical aspects have been identified as one factor affecting learner experience with asynchronous online discussions.

A good interface design can help learners overcome the technical barriers that may occur while using a system (Metros & Hedberg, 2002). More importantly, a good interface design can positively influence the quality and the quantity of the interactions in an online learning community (Swan, 2004). Discussion platforms are the vehicle for online instructors to represent and conduct learning activities. If the discussion tools that online course designers selected did not meet students’ expectations, the activity might result in low participation rate and poor design. Compared to the limited participation in asynchronous online discussions, today’s learners spend significant time on social media interactions in their everyday life. The different perceptions with discussions in online classes and social media platforms may due to learners’ past experiences (Deng & Tavares, 2013).

Many online learners have learning curves in online learning environments. The anxiety of using new technologies has created unnecessary obstacles to learner performance. Many asynchronous online discussion platforms are based on text. This text-heavy interface design leads to information and cognitive overload to online learners (Vonderwell & Zachariah, 2005). In this research, we examined the Mayer’s (2005) 12 principles of multimedia learning to provide design guidelines for online instructors. Therefore, instructors can search for the discussion platforms with the design features that can achieve their learning objectives. From learner perspective, the intuitive design of a user interface can help learners feel less intimidated and use the platform more. Thus, their learning performance can improve.

Given asynchronous discussion activities are the primary means for online learners to interact with each other, it is essential for course designers to understand the nature of the discussion activities that can accomplish the learning objectives. A small body of literature studied learner perceptions of online discussion platforms by using the Technology Acceptance Model (TAM). However, this model only provides general information about technology by users (Liu, Chen, Sun, Wible, & Kuo, 2010). We have studied the design features of three online discussion platforms: Discussion Board (DB) in the Blackboard learning management system (LMS), Piazza, and Yellowdig. By interviewing the online instructors and observing their online asynchronous discussion activities, we
have created an interactive design matrix to help online instructors determine the appropriate types of discussion platforms for their online classes.

The primary focus of this research is to identify the design patterns in designing effective asynchronous online discussions. Architect Christopher Alexander defined design patterns as reusable elements for solving recurring problems (Alexander, Ishikawa, & Silverstein, 1977). Design patterns are guidelines rather than prescriptions (Rohse & Anderson, 2006). In our research, the common and most useful design features in the online discussion platforms are identified as the design patterns for selecting asynchronous online discussion platforms. This interactive design matrix is built upon design principles and best practices to reveal the critical design features that fit online instructors’ needs for their intended asynchronous discussion activities. These design features can also tell online instructors the grading schemas should be included in their online discussion rubrics.

Learning Experience and Intrinsic Motivation

In this research, we proposed a design model and instrument to help online instructors create intuitive asynchronous discussion activities for learners. Besides the 12 principles of multimedia learning, we also integrated the universal design for learning (UDL) framework to guide our design. UDL has proved its positive influence in students’ academic gains and increased engagement (Rao & Meo, 2016). This framework focuses on the reduction of barriers in learning environment to create more inclusive classes for all learners (Al-Azawei, Serenelli, & Lundqvist, 2016). The traditional TAM mainly focuses on users’ perceptions on the usability of systems, which is not suitable for online learning contexts, as online learning involves hedonic aspects of human-computer interactions. Beyond the perceived usefulness and ease of use, a hedonic-motivation system adoption model (HMSAM) added “cognitive absorption” (CA) as a new factor impacting users’ behavioral intention to use the system (Lowry, Gaskin, Twyman, Hammer, & Roberts, 2013). The sub-constructs in CA were built upon the flow theory and intrinsic motivation. The finalized HMSAM revealed that users’ perceived use of ease affected their behavioral intentions to use a system through the mediation of perceived usefulness, curiosity, and joy (Lowry et al., 2013).

Similarly, Jordan (2000) categorized the evaluation of a product design into three levels (from low to high): 1- functionality, 2 – usability, and 3 – pleasure. This model suggests that beyond designing functional and effective products, the design of product should also bring pleasure to users. Pleasure refers to the satisfaction with the use of the product that users can emotionally relate to their real lives (Jordan, 2000). Some online discussion platforms have integrated the social and gaming mechanics in social network sites (SNSs), e.g., Facebook, Instagram, and Twitter, to their interface design (i.e., emoji, hashtag, leaderboard, likes, etc.), as many of online learners have used at least one SNS in their everyday life. Ryan and Deci (2000) asserted that intrinsic motivation leads to high-quality learning. Given that intrinsic motivation lies in people’s innate needs for competence, autonomy, and relatedness (Ryan & Deci, 2000), the similarities of the interface design between the technology tools used in online courses and learners’ daily life can trigger online learners’ intrinsic motivation. Hence, authentic asynchronous online discussions can effectively engage online learners.

In the design and development process of asynchronous online discussions, instructors are also the stakeholders. By understanding the importance of pleasure in learning and self-determination theory (SDT), online instructors can create meaningful and engaging learning activities for learners. Moreover, online instructors need to monitor learner performance in discussion platforms to steer class discussions in the right direction. The discussion platforms they select must align with the HMSAM, which means that online instructors implement the platform with high intrinsic motivation. Compared to face-to-face classes, online instructors lack means for building connections with their students and understand their learners’ needs in a timely manner. If the selected online discussion platforms have built-in learning analytical mechanics, they will bring pleasure to online instructors. Therefore, online instructors can provide efficient feedback with their learners. The selection of an appropriate asynchronous online discussion platform should take the needs from both learners and instructors into consideration.

Asynchronous Online Discussion Platforms and Themes

Online instructors constantly face guideline dilemma in asynchronous online discussions, i.e., use of grades, use of number of posting guidelines, and instructor-facilitation (Hew et al., 2010). Our university has integrated three asynchronous discussion platforms in the Blackboard LMS. We have collaborated with university faculty members to design online and blended courses. Each of the discussion platforms can represent a distinctive need for asynchronous online discussions. From the conversations with the instructors and the observations of their online discussion activities, we have found different discussion themes as needed by the instructors on the three online discussion platforms.
1. LMS Built-in Discussion Platform

Blackboard Discussion Board (DB) allows instructors to create independent discussion forums (see Figure 1). Instructors can differentiate the activity requirements and grading schemas based on independent discussion forums. The interface design for learner interactions on DB is not quite intuitive, as it requires multiple steps for instructors and learners to view each student’s post. Instructors can only view the overall number of students’ posts in each discussion forum, while manually tracking conversation flows and the quality of their students’ posts. Instructors prefer to use this platform when they focus on content assessment, as well as need flexibility in grading different discussion forums.

![Figure 1](https://via.placeholder.com/150)

**Figure 1.** An example of Discussion Board in the Blackboard LMS for asynchronous online discussions

This discussion platform is suitable for end-of-chapter questions, as the purpose of this type of discussions is to assess each individual student’s understanding of the assigned topics. The focus is not on student interaction but on content comprehension. Rather than providing students’ opportunities for submitting individual reflections, a class discussion forum can help learners compare themselves with peers to check their understandings of the content.

This type of discussion activity can enhance active learning, as each student can share coaching and scaffolding information with peers. Learners can improve their communication skills and deep thinking skills through active learning (Prince, 2004). Moreover, knowledge acquisition shifts from instructor-to-student to student-to-student delivery. We recommend online instructors to use these self-checking discussion forums as low-stake activities, as each online learner needs a process to disclose and polish their thoughts. Online instructors can turn on “participate before seeing others’ posts” function to give every student an opportunity to process and digest the learning content before seeing others’ opinions.

2. Collaborative Learning Community

Piazza is a wiki-style Q&A collaborative platform. Instructors can create discussion forums as separate folders in Piazza (see Figure 2). Learners can view most recent class interactions on the main dashboard without going into the specific forum. Unread posts, peers’ feedback, and instructor’s posts have different colored icons. The average answering time for a question and the class contribution leaderboards are available to the instructor and the learners. Many STEM instructors use Piazza to promote student collaboration, as students form a learning community when the instructor clearly sets up the discussion rubric beforehand.
This type of discussion platform is suitable for learners to contribute answers and solutions to their peers’ questions. This type of discussion activities should be problem-solving oriented, as well as student autonomous discussions. The discussion purpose should not focus on the quality of each question but the quantity of contributions to peers’ confusions. We recommend instructors to use this type of discussion platform for extra points or no points for learners, as students should not be penalized if they do not have questions or not have time to answer peers’ questions.

This discussion platform can help instructors identify the students who constantly struggle with the course content, as well as the proactive learners. Additionally, instructors can also find the concepts or homework that many students have issues. According to the UDL principles, instructors need to provide multiple means of representation for learners (CAST, 2018). Instructors can clarify the language and/or equations to scaffold online learners more effectively.

3. Social Learning Platform

Yellowdig is an online social learning platform with an interface like the SNSs. Learners can earn experience points (XPs) by posting, commenting, and like their peers’ posts. Each student can monitor their individual performance such as the quality of posts, class influence, and class popularity on the discussion platform dashboard. Yellowdig also has a built-in grading rubric assigning XPs by using the minimum word numbers of students’ posts and comments, which saves online instructors efforts in grading students’ works. The instructors we have interviewed indicated the quality and quantity of students’ posts in Yellowdig increased more than 50% compared to other online discussion platforms. Some instructors suggested Yellowdig was more suitable for augmenting in-class participations as in face-to-face classrooms rather than presenting “APA-styled formal reflections.” We found most instructors had a learning curve when they were firstly introduced to Yellowdig. However, many instructors felt their efforts were paid off after seeing student interactions significantly improve in their online classes.
In the 2017 research report of ECAR study of undergraduate students and information technology, 42% undergraduate students rated social media as one of the tools that “wish instructors used LESS” in classes (Brooks & Pomerantz, 2017). Despite the popularity of social media tools being used in students’ everyday life, they do not feel comfortable to use personal social media accounts for academic works. This resistance of using social media tools in academic contexts provides opportunities for Yellowdig this type of discussion platforms, as they use the mechanics in social media platforms but adapt them into educational contexts. With the seamless integration into the LMS, learners do not need to register new user accounts with these platforms or worry if their personal life could be exposed to academic settings.

This type of discussion platforms is suitable for class participation, which allows students to share outside classroom resources with peers. The layout of the discussion platform can promote learners to create a knowledge base for the entire class and utilize the shared resources in their future studies. Online students are encouraged to view and comment on peers’ posts, which can record participation points for students. However, the participation points that students accumulate in a social discussion platform should not be regarded as grades. Every student wants to earn 100% in a grade, but their final grades can be affected by their deficiencies in certain rubric criteria. On the other hand, every student can earn 100% class participation points in a social discussion platform as the 100% participation is a baseline for learners to achieve, as long as they fulfill the minimum requirements, every student can be an “A” student in an online social discussion platform. The participation points also encourage students to contribute more to classes, as well as reduce online instructors’ workload in monitoring and grading student discussions.

4. Design Patterns in the Discussion Platforms

Besides the discussion themes we observed on the three types of asynchronous online discussion platforms, we compared the design features that the discussion platforms have, along with the built-in learning analytical mechanics they have. The design patterns used in the discussion platforms help us generate the design guidelines that online instructors can follow when they create discussion activities (See Table 1).

<table>
<thead>
<tr>
<th>Platform</th>
<th>Comments</th>
<th>Forums</th>
<th>Hashtag</th>
<th>Badge</th>
<th>Leaderboard</th>
<th>Posts</th>
<th>Subscription</th>
<th>Upvotes*</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB in Blackboard</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Piazza</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Yellowdig</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Note. *For example, likes, endorsements, and ratings.
Although some design features are common, their uses are varied. For example, students can subscribe to the discussion forums and posts in DB, but online instructors need to turn on and/or off that functionality in advance. Students have no options to make decisions. In contrast, both Piazza and Yellowdig can send push notifications to online learners unless learners unsubscribe the class discussion forums. Another example is the “upvotes” feature in the three platforms. In Blackboard, only instructors can decide whether to use this feature, whereas in Piazza and Yellowdig, the setting of this design feature is by default. Students can opt to not like or endorse others’ posts, but they will see the availability of this design feature. Additionally, instructors can change the points associated with “upvotes” in Yellowdig.

We also examined the learning analytical mechanics in the three discussion platforms (See Table 2). Yellowdig has implemented all analytical mechanics and operate them automatically. In its dashboard, online instructors can view a summary of each learner’s behaviors. From learner perspective, they can view the total points they have accumulated in Yellowdig. Yellowdig automatically assigns participation points to learners once they reach the minimum words of posts and comments. The author of a post and a comment will also earn points if other students upvote their inputs. Moreover, online instructors can assign instructor badges or revoke points from online learners.

Table 2. Built-in Analytical Tools in the Discussion Platforms

<table>
<thead>
<tr>
<th>Discussion Platform</th>
<th>Counts of Comments</th>
<th>Counts of Posts</th>
<th>Counts of Visits</th>
<th>Points</th>
<th>Rubric</th>
<th>Time Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB in Blackboard</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Piazza</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Yellowdig</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

DB in Blackboard has the second most analytical mechanics. However, it does not have an “all-in-one” dashboard to view student performance. Instructors can download class reporting to track student performance, such as numbers of views in each discussion forum, total counts of posts and comments in each discussion forum. Besides, online instructors need to go to grading center to manually assign grades to each student posts and comments. If instructors decide to use rubrics to grade student performance, they need to manually create criteria and level of achievements to embed rubrics into each discussion forum. This process usually costs a considerably large amount of workload for online instructors. This process also reinforces instructors to focus on the instructor-to-student delivery mode rather than a student-centric learning approach.

Piazza does not implement every analytical mechanic to its platform due to the purpose of the use of this asynchronous discussion platform. Piazza is designated for class discussions of problem solutions, so the platform only records the number counts of online students’ questions and contributions. The grade book in Piazza is not integrated to LMS. Instructors can manually export the class report and insert them to the grade book in LMS.

Design Frameworks

Through the discussion themes and the use of design patterns in these asynchronous online discussion platforms, we aim to help online instructors identify the most suitable platform type for their discussion activities. We tie the principles and guidelines for discussion activity design with the specific design patterns that online instructors can implement into the discussion activities and learner assessment. We also identify the challenges that we could face in the design process. Although the advancement in technology has significantly influenced industries, its impacts in higher education are moderate, as many stakeholders have taken part in the process of new technology integration. If not being mandated by the institution, instructors create learning activities based on their teaching preferences. Specifically, they might choose different online discussion platforms for similar discussion activities due to their different comfort levels with technologies. However, each online discussion platform has its pros and cons; it is online instructors’ selected activity type and organization that affect learning effectiveness.

Herrington (2006) posited that as many universities use LMSs to deliver online courses, instructors tend to focus more on information delivery through the use of a LMS than create meaningful activities for substantive learning. In this research, we created an interactive matrix to help online instructors identify the discussion platforms that most suitable for their desired learning activities and desired learning outcomes. We used the 12 principles of multimedia learning by Richard Mayer (2005) and the UDL framework by CAST (2018) to guide the design patterns that should be included in discussion activity design. We distinguished these two theories by emphasizing them on different aspects of creating asynchronous online discussion experience for learners. Multimedia learning
principles focus on the use of multimedia in discussion activities, whereas UDL principles focus on the narrative of discussion instructions. We examined the aspects that multimedia learning and UDL principles cover and overlap as shown in Table 3. We mapped these design guidelines with each discussion platform, which display in the interactive design matrix we developed in this research as a result for instructors’ intended discussion activities (See Appendix 1).

Table 3. Comparisons between Multimedia Learning Principles and UDL Guidelines

<table>
<thead>
<tr>
<th>Design Theory</th>
<th>Content</th>
<th>Organization</th>
<th>Representation</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 Multimedia Learning Principles</td>
<td>Conversational than formal (10)</td>
<td>Highlighted cues (2); User-paced segments (6); Clarify and decode symbols and text (7)</td>
<td>Graphic and narration (3, 5, 8, 9); Corresponding words and pictures are presented near (4); No extraneous words, pictures, and sounds (1)</td>
</tr>
<tr>
<td>9 UDL Guidelines</td>
<td>Alternatives for auditory or visual information (1); Background Knowledge (3.1)</td>
<td>Highlighted cues (3.2); Clarify and decode symbols and text (2)</td>
<td>Graphic and narration (1.1, 5.1)</td>
</tr>
</tbody>
</table>

*Note. The numbers in this table are the principles or guideline numbers in the respective learning theory.*

Additionally, we followed 4 Maximums of Grice’s Cooperative Principles (1975): *quantity, quality, relevance*, and *manner* to group the essential discussion metrics that instructors can emphasize in evaluating their online discussion activities. After observing the analytical mechanics in the discussion platforms and instructors’ feedback, we added a new discussion metric *time investment* to the analytical mechanics can be used in online discussions (See Table 4). Many studies have shown that the amount of time students actively spent on tasks can affect their success in learning (Carroll, 1963; Lee, 2018; Wellman & Marcinkiewicz, 2004). The LMS and the asynchronous online discussion platforms have log files for time-on-task of students. Online instructors can visualize students’ frequencies of time-on-tasks in Piazza and Yellowdig; whereas they can export a class report from the LMS to analyze students’ frequency logs in DB. Adding time investment to the grading schemas for a discussion rubric can provide more information and perspective for online instructors to evaluate their student performance. The interactive design matrix we developed in this research displays key grading schemas for online instructors’ selected discussion activities (See Appendix 2).

Table 4. Essential Discussion Metrics in Online Asynchronous Discussions

<table>
<thead>
<tr>
<th>Design Guidelines</th>
<th>Content</th>
<th>Expression</th>
<th>Engagement</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Maxims of Communication</td>
<td>Provable by adequate evidence; Relevant to the discussion topic</td>
<td>Informative as required, no more or less; Direct without ambiguity</td>
<td>Time spent in the learning community</td>
</tr>
<tr>
<td>Time Investment</td>
<td></td>
<td></td>
<td>Multiple media for communication (5.1); Multiple tools for construction and composition (5.2)</td>
</tr>
<tr>
<td>UDL Guidelines</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Interactive Design Matrix for Online Discussion Activities**

This section introduces the development process of the interactive design matrix. We used PHP and JavaScript to create an online self-report survey for instructors to complete (See Appendix 1). Upon completion, this online survey generates a list of design guidelines and the suitable discussion platforms for instructors’ target students and discussion activities. Figure 4 shows the design model of our project. In our online instrument,
instructors will provide information on their target students’ characteristics, types of discussion activities, instructor’s technology skills, and needs for learner’s real-time data. Instructors will select answers in the format of multiple choices and Likert Scale questions. Based upon the responses to the survey questions, instructors will see a list of design guidelines that they can follow to build discussion activities, as well as a sample discussion rubric that can measure their desired learning objectives of discussion activities. We have included the design rationale for each survey question in the following section.

![Diagram](image)

Figure 4. The design model of creating intuitive online discussions

1. Target student population

Among the three types of discussion platforms, social learning platform is the most advanced platform for instructors to adopt. Depending on the student characteristics, traditional undergraduate students do not have limitations to any discussion platform if the discussion activities are meaningful. Graduate students tend to have higher motivation and needs for collaboration and in-depth discussions. Therefore, social learning platform is most suitable for them. For a mixed student population or non-traditional students, we recommend online instructors to use the LMS built-in discussion platform to conduct discussion activities, as these students tend to have longer learning curves.

2. Motivations for Conducting Discussions

We categorized instructors’ motivation for conducting asynchronous online discussions into three types. If the instructor plans to assess student understandings of the class concepts, they can conduct asynchronous discussions on any platform. If they plan to create a learning community to promote knowledge building, an open collaborative platform will suit their needs. If the instructor plans to provide opportunities for students to interact with each other, such as self-introduction prior to small group projects, a social learning platform will be an ideal interface for students to conduct this type of discussions. In addition, we have encountered some instructors implemented asynchronous discussions to their online courses only because it is a mandatory requirement from their departments or colleges. If this is the case, then a LMS built-in discussion platform can be an easy solution.

This survey question also affects the grading schemas in discussion rubrics. If the instructor focuses on the content and institutional requirements, then quality and relation are the two major grading schemas should be included in the rubric. If the instructor emphasizes the development of a learning community or student interactions, then quantity and time investment would be the two grading schemas in the rubric. Besides, in a learning community, the relation of discussion posts also matters; while in student interactions, manner should be taken into consideration.
3. Current Problems in Online Discussions

Instructors will indicate their primary concerns for their current asynchronous discussion activities. The aspects could be lack of interactions, lack of engagement, and lack of collaborations. Instructors can select all problems relevant to their current online discussions. If the instructor indicated that students lack interactions in current online classes, a social learning platform can help solve this problem. If the instructor considered student lack collaborations in the current online classes, an open collaborative discussion platform will be a good solution for this scenario. If the instructor indicated that the students lack engagement in online discussions, no specific discussion platform would significantly reverse this problem. But, instructors can follow the design guidelines we provide to refine their discussion instructions and activities.

4. Types of Discussion Activities

We identified five types of asynchronous online discussions. If the instructor decides to have students respond to a set of end-of-chapter questions, they can use the LMS built-in discussion platform. If the instructor wants online students to discuss homework or promote higher-order thinking skills, i.e., debating and critiquing, they can use open collaborative discussion platform. If the instructor wants students to share out-of-class resources and contribute to open-ended questions, they can use a social learning platform to achieve their discussion goals. Or if the instructor wants to provide a platform for online learners to share group projects, they can use any of the three discussion platforms to conduct this type of discussion activity.

The types of discussion activities influence the grading schemas in the rubric. For end-of-chapter reading discussions and group assignment sharing, quality and relation are the main foci in the rubric. For homework Q&A and higher-order thinking skills, quantity and time investment are the primary schemas in grading rubrics. If assessing student contributions to class participations, quantity, manner, and time investment are the suggested grading schemas in a rubric.

5. Grading Schemas

We also asked respondents for the grading schemas that they value the most. Respondents can choose from “quality of content”, “quality of interaction”, “numbers of contributions”, and “time investment” to reinforce the aspects that they want to assess learners. Each choice is mapped with one or more design metrics in learner evaluation. For example, if the instructor valued “quality of interaction” the most, then quality, manner, and relation will add more weights in the discussion rubric generated for the instructor once they complete the survey.

6. Technology Integration Skills

This Likert Scale survey question has a list of statements investigating instructors’ attitudes towards technology integration in teaching. Instructors will rate from 5-agree to 1-disagree for each statement to indicate their openness to technology integration. These technology integration questions are adapted from a free technology survey template in QuestionPro (https://labs.questionpro.com/a/q/questionpro--technology-survey-5543460). Respondents’ attitude towards each statement will add or subtract points they can earn for the openness to technology. The total points they have earned in this question are the indicators to low, intermediate, and high technology skills. LMS built-in discussion platforms requires low technology skills; open collaborative discussion platform needs intermediate technology skills; social learning platforms require instructors to have high technology skills and strong motivations. Additionally, if the instructor has equal scores for two and more discussion platforms, their points earned for this survey question will overrule the result. Since instructors will be the one that operate and manage online discussions, they need to feel comfortable about the platforms that discussions take place.

7. “Must-Have” Features in Online Discussion Platforms

This Likert Scale survey question is to investigate instructors’ needs for the features that they would like to see in online discussion platforms. This question consists of 5 statements, which are summarized upon the interviews we had with the instructors. Depending on the agreement levels (Agree, Somewhat Agree, Neutral, Somewhat Disagree, Disagree) the instructors rated, these statements indicate instructors’ preferences for different types of discussion platforms. Meanwhile, some statements also indicate the grading schemas that instructors want to use in the discussion rubric.
Figure 5 is a screenshot of a sample discussion platform and design guidelines that the online survey generates upon instructor completion. The bullet points are the key design guidelines that instructors can follow when they create the discussion activities on the suggested discussion platform. In addition, participating instructors also receive a sample rubric with weighted grading schemas that are related to their discussion activities. The instructors’ choices for each survey question as shown in Appendix 3 add scores to a specific type of discussion platform and/or grading schemas to their discussion activities.

Future Steps

We have demonstrated this tool to a small group of audience at our university. We will integrate this instrument to the online course development process in our department. Therefore, we can 1) better assist the faculty members to select and create intuitive asynchronous discussion activities; 2) evaluate the effectiveness of this instrument. We will add more background information questions to the instrument for us to collect data such as different academic disciplines and instructor demographic background.
References


## Appendix 1: Design Guidelines for Each Type of Asynchronous Online Discussion Platform

<table>
<thead>
<tr>
<th>Recommended Discussion Platform</th>
<th>Discussion Prompt Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMS built-in discussion tool</td>
<td>When you write the discussion prompt for each discussion topic, please consider using <strong>words and pictures</strong>. If you decide to include any video clip to the discussion prompt, please make sure that the video clip is closed captioned. Please keep your discussion prompt conversational than formal. Your students will learn better from <strong>graphics and narrations</strong> than from animation and on-screen text. If your discussion prompt is longer than 3 sentences and including multiple tasks, please <strong>segment the information</strong> with bullet points or highlighted cues.</td>
</tr>
<tr>
<td>Open collaborative discussion platform (e.g., Google Community, PBWorks, and Piazza)</td>
<td>If you include online resources (web links, pictures, audio files, etc.) in the discussion prompt, please write a short blurb to <strong>clarify the resources</strong>.</td>
</tr>
<tr>
<td>Social learning discussion platform (e.g., Facebook, Twitter, and Yellowdig)</td>
<td></td>
</tr>
</tbody>
</table>

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## Appendix 2: A Complete Rubric for Assessing Asynchronous Online Discussions

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Wow (4 points)</th>
<th>Good (3 points)</th>
<th>Average (2 points)</th>
<th>Poor (1 point)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of Post (20%)</td>
<td>Provide adequate evidence; Very informative as required</td>
<td>Provide superficial evidence; Somewhat informative</td>
<td>Provide inadequate evidence; Missing information</td>
<td>Show minimum effort to write a post</td>
</tr>
<tr>
<td>Relevance of Post (20%)</td>
<td>Relevant to the discussion topic; Integrating outside resources and cite appropriately</td>
<td>Somewhat relevant to the discussion topic; Provide some supportive documents</td>
<td>Somewhat relevant to the discussion topic; No supportive document</td>
<td>Post topics do not relate to the discussion content</td>
</tr>
<tr>
<td>Contribution to the Learning Community (20%)</td>
<td>Prompt responses to peer posts; Focused argument with supportive information; Developing further discussion by building on peer posts</td>
<td>Prompt responses to peer posts; Somewhat focused argument; Frequently contribute to ongoing conversations</td>
<td>Frequently not responding to peer posts; Sometimes contribute to ongoing conversations</td>
<td>Show minimum effort to write a response (e.g., “I agree with John”, “thank you for sharing”)</td>
</tr>
<tr>
<td>Etiquette (20%)</td>
<td>Discussion interactions are polite and to the point; Show respect and sensitivity to peers’ backgrounds</td>
<td>Discussion interactions sometimes are excessively long and show no sensitivity to others’ perspectives; Show respect and sensitivity to peers’ backgrounds</td>
<td>Discussion interactions are ambiguous; Show little respect or sensitivity to peers’ backgrounds</td>
<td>Show no respect or sensitivity to peers’ backgrounds</td>
</tr>
<tr>
<td>Engagement (20%)</td>
<td>Frequently view peers’ posts; Respond to diverse peers’ posts; Present creative approaches to the topic</td>
<td>Read most peers’ posts; Attempt to respond to different peers’ posts; Present traditional approach to the topic</td>
<td>Do not read peer posts; Respond to few peers’ posts; Do not spend time in providing high quality contribution in discussion</td>
<td>Show minimum effort to participate in discussions</td>
</tr>
</tbody>
</table>
Appendix 3: Interactive Design Matrix for Asynchronous Online Discussions

1. Which one is the best description of your students?
   - Traditional undergraduate students
   - Graduate students
   - Non-traditional college students
   - Mix of student population

2. Why do you want to have discussion activities in this online class?
   - Assess student understandings of the class concepts
   - Create a learning community to promote knowledge building
   - Provide opportunities for students to interact with each other
   - My institute’s requirements

3. What are the problems in your current online class? (Please select all that apply)
   - Lack of student interactions
   - Lack of student engagement
   - Lack of collaboration
   - Not applicable

4. What type of discussion activities do you plan to use for this online class? (Please select all that apply)
   - End of chapter reading discussion
   - Class participation (e.g., open-ended questions, sharing resources)
   - Homework Q&A
   - Group assignment/project sharing and commenting
   - Promote higher-order thinking skills (e.g., debate, critique and analyze topics)

5. Which grading scheme do you value the most when evaluating students’ discussions in this class?
   - Quality of content
   - Quality of interaction
   - Numbers of contribution (e.g., posting and commenting)
   - The time that students spend on the discussion platform (including reading posts and writing comments)

6. Please select the answer that most accurately describes your feelings about using technology (5-agree, 4-somewhat agree, 3-neutral, 2-somewhat disagree, 1-disagree)
   - I feel confident in my ability to integrate multiple technologies into my instruction.
   - I have a good variety of ideas and lessons for integrating technology into my teaching.
   - The amount of time needed to prepare technology-based lessons deters me from creating them.
   - I believe that integrating technology into my curriculum is important for student success.
   - I am aware of the resources available by my institution that can help me learn how to integrate technology.
   - I do not have the technology skills to support the students when they use technology for a project.

7. Please select the answer that most accurately describes your feelings about using a discussion platform (5-agree, 4-somewhat agree, 3-neutral, 2-somewhat disagree, 1-disagree)
   - It is important for me to know how long students spend on their discussion activities
   - My online students should have multiple means to provide feedback to their peers [Ex. Text comments, upvoting, voice comment, etc.]
   - It is important for my online students to view their peers’ level of engagement [Ex: numbers of posts and comments, time spent in total, offline or online status]
   - It is important for my online students to have mobile apps
   - I like being able to intervene student participation in discussions