

## REAPING THE AFFORDANCES AND CONSTRAINTS OF CANVAS-DRIVEN ASYNCHRONOUS ONLINE DISCUSSION BOARDS (AODBs)

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**Abstract:** Asynchronous online discussion board (AODB) has turned into a crucial tool for online and blended learning, as well as some in-class teaching contexts, in higher education (HE). Despite not being initially designed for teaching, it is now prominently featured as a learning autonomy promoter. This research is henceforth crucial due to the dearth of comprehensive assessments of how a technology enables lecturers to tote out the AODB-related activities. Employing technology affordance framework helped shape this study's discoveries. Via the 16-week observations on the five lecturers' AODBs in Canvas LMS, this study put together four supporting features, enabling this study to capture lecturers' efforts to set up AODBs for pedagogical process. There are *instruction pages*, *settings*, *search entries for authors*, *replies and likes*. These features led this study to lump together the interview data from three lecturers into four affordances of Canvas-mediated AODB (consisting of *collaboration*, *flexibility*, *knowledge record*, and *monitoring and assessment*) and two constraints (*mobile accessibility* and *usability for grading*). The disclosure of Canvas-mediated AODBs' affordances and constraints may introduce some brand-new details to the realm of discussion in education. Even so, further study scrutinizing various platforms and employing a variety of lecturer profiles is highly encouraged in order to result in a wider range of facts regarding AODB in HE.

**Keywords:** *Asynchronous Online Discussion Board (AODB); Canvas LMS; technology affordance framework*

### INTRODUCTION

Higher education (HE) has been under pressure to experiment with novel pedagogies as a result of growing class sizes, shrinking resources, and a widening range of student cohorts (Boud & Symes, 2000). In response to this, using an asynchronous learning tool has grown in importance for delivering courses in HE (Dykman & Davis, 2008).

Asynchronous online discussion boards (AODBs) then have gained traction in fully online, blended learning, and even in in-class courses in HE (CARR, 2020). Such uses of AODBs, which are often threaded discussion forums, are common in the educational contexts. Asynchronous discussions taking place on the internet under a variety of threads (Kirk & Orr, 2003) are known as threaded discussion forums. A "thread" is a single topic of discussion, the name of which appears in the subject line of all postings related to it. A threaded discussion forum, from a technological perspective, makes use of electronic bulletin board software to compile the various message posts and provide the users the option of seeing the messages in chronological order, topical order, or even both.

Despite not originally designed for pedagogical purposes (Danaher, Rodes, & Kranov, 2021), they prove to be a core pedagogical medium (Garrison & Vaughan, 2008; Fehrman & Watson, 2020). The initial purpose of AODBs was to enable unrestricted and structured communication among large groups of people across time zones and geographical boundaries (Danaher, Rodes, & Kranov, 2021). They serve as a prime illustration of the Internet-enabled anytime-and-anywhere communication. To this point, Danaher, Rodes, and Kranov (2021) accentuated that AODB conveys participants with a one-off room to take part in substantive discussions beyond a typical educational context, which will let them accomplish the learning objectives.

In accordance with remote education and adult learning theories, learners are jointly responsible for organizing their learning and navigating the online learning environment (Galustyan et al., 2019). AODBs are a key component of how online learners take control of their learning because they provide them the chance to communicate with classmates and teachers, share experiences, and come up with creative solutions to issues (Hew et al., 2010; Putman, 2012; Ringler et

al., 2015). In addition to fostering a sense of community, learners can use AODBs to explore new ideas, assess their own points of view, and improve social and collaborative processes (Garrison et al., 2001). Due to the asynchronous nature of this kind of communication, students have the flexibility to reflect on questions and revisit posts (Cheung & Hew, 2004; Garrison et al., 2001; Putman, 2012; Wu et al., 2013).

To Campbell et al. (2008), teacher candidates typically perform better academically when they are more actively involved in using the readings, course materials, and online discussions. There are certain drawbacks to the broad use of AODBs. The most common example of disengagement is when people respond in a robotic, forced, artificial, superficial, or deceptive manner (Biesenbach-Lucas, 2003; Ding, Kim, Orey, 2017; McKinney, 2018; (Xie, Durrington, & Yen, 2011). Additionally, not all students may benefit from AODBs that are mostly based on text (Green & Green, 2018). Without the use of nonverbal indicators like gestures, smiles, or voice tones, it is possible to unintentionally create assumptions and misinterpretations (Clark, Strudler, & Rove, 2015; Hara, Bonk, & Angeli, 2000). These challenges may serve as catalysts for lecturers to explore novel avenues, devising activities within AODBs that enhance student involvement. Notably, leveraging the lecturers' creativity to harness technology features for crafting captivating asynchronous learning environments can alleviate student concerns.

To carry out AODB-related activities, a particular technology tool is required. LMSs are used by the majority of lecturers to encourage instruction and interaction in AODBs. Most LMSs come with a threaded discussion board feature, and Canvas LMS is one of the kinds. Since its invention in 2008, Canvas has been hailed as innovative and wholly distinct from other LMSs (Nettles & Futch, 2012). Referring to a 2019 report by University College Cork Partners with Canvas, Canvas has rapidly acquired market share and is now utilized at over 4,000 universities globally. Furthermore, Canvas was evaluated by university students participating in Paynter and Barnes's research in 2021. Canvas got positive input from students as an LMS with a highly simple and intuitive user interface (Paynter & Barnes, 2021). Similar to this, Canvas received overwhelming support from students in an Illinois pilot program due to its design, user interface, and mobile learning functionalities (Smith, 2018).

Since exceptional support has been shown to AODBs and Canvas, it is advisable for HE institutions to start taking AODBs (Cho & Tobias, 2016; Gao, Zhang, & Franklin, 2013), and Canvas LMS into account. This study, thus, intends to contribute to the trend, by examining Canvas-mediated AODBs in the realm. Besides, although extensive research has been undertaken on the perception of faculty members, university students, and administrators (see Paynter & Barnes, 2021; Wilcox, Thall, & Griffin, 2016), no single study exists which lecturers' stepwise practices

and experiences on Canvas-mediated AODBs are thoroughly cataloged. This study, therefore, attempts to grasp the lecturers' experiences of utilizing features on Canvas discussion boards to set up AODBs and manage the teaching and learning processes. To be more precise, the lecturers' experiences in implementing asynchronous online discussions using Canvas discussion board has helped this study to assemble the affordances and constraints of Canvas itself as an AODB medium.

Gibson (1979) coined the phrase "affordance", which has grown in use in the field of education. Numerous definitions have been suggested for this phrase (Bower, 2008; Hartson, 2003; McGrenere & Ho, 2000). Originally, Gibson used the phrase to describe a connection between animals and the environment in a study on ecological psychology (Bucher & Helmond, 2018). Gibson claims that the animals will directly acquire visible information of environments via an ambient optic array. The information gathered consists of affordances - what the environment supplies or furnishes the animal, whether for good or ill (Gibson, 1979).

According to McGrenere and Ho (2000), the three essential principles of Gibson's affordances are as follows: (1) An affordance exists independently of an actor's prior experience, knowledge, and capacity for perception; (2) it also exists independently of the actor's ability to carry out actions toward an object; and (3) it does not depend on the alteration of an actor's wants or intentions. The phrase can be widely construed as the relationship between a human and an object because those ideas depend on an actor to determine whether an affordance exists. Bucher and Helmond (2018) use fire as an example of something that can give warmth, illumination, and cooking while simultaneously causing skin damage. However, what distinguishes warmth from damage is frequently ambiguous, necessitating an actor's skill to discern the line (Bucher & Helmond, 2018).

Gibson's affordance notion has found widespread use. Design studies and Human-Computer Interaction (HCI) are two subjects that have accepted the affordance notion. The word quickly became a key concept among scholars, educators, and practitioners (Bucher & Helmond, 2018; Kaptelinin & Nardi, 2012). Gibson's notion of affordance is at odds with Norman's. According to Norman (1988), affordance refers to a thing's actual and perceived attributes, particularly its fundamental characteristics that affect how it might be used. A chair affords sitting since it affords (or 'is for') support. Carrying a chair is also possible. In a number of areas, this definition openly departs from Gibson's.

Despite the fact that Gibson's and Norman's conceptions are still being discussed by academics (Kaptelinin & Nardi, 2012; Hartson, McGrenere & Ho, 2000), numerous academics have modified the theory of affordances according to their setting, expertise, and goals (Vaast & Kaganer, 2013). For instance, Conole

and Dyke (2004) incorporated the affordance into ICT teaching. Referring to Norman's belief that an object's functions would be simpler to ascertain if it had a more effective design, these researchers contend that the idea of affordances might be broadened and used to present-day ICT applications to have both a favorable and unfavorable effect on users (Conole & Dyke, 2004).

The basis for this study's efforts to more closely examine Canvas as an intermediary of AODBs is thus a brand-new account of affordance theory from Conole and Dyke (2004). This serves as the overarching framework for this study's analysis, collection, and categorization of the lecturer's experiences on the functionalities of each Canvas discussion board's features. To delineate the objectives of this research, the subsequent inquiries are posed: (1) How do the lecturers set up AODBs using Canvas discussion features? (2) What are the affordances and constraints of Canvas-driven AODB?

## METHOD

A comprehensive exploration into how Canvas features both enable and constrain lecturers in their endeavors to design AODBs is at the heart of this study. To dissect this matter, this study employed a descriptive qualitative research approach. The employment of qualitative research shepherded this study through a thorough inquiry, to compile detailed data based on the participants' moxie, viewpoints, and backgrounds (Braun & Clarke, 2013). Regarding this, this study spotted the lecturers' experiences with using Canvas Discussion Boards to moderate AODB-related activities. With the help of technology affordance framework, this study makes an effort to dissect the lecturers' uses of Canvas features in designing AODBs. Then, their experiences of using Canvas features led this study to assemble the affordances and constraints of Canvas-driven AODBs. To this point, this study meets the idea of qualitative research as deconstructing assumptions is one of the purposes (Bhattacharya, 2017).

Participating in this study were three lecturers who are used to designing AODBs-related activities using Canvas discussion boards. Purposive sampling was used to recruit the participant, who was chosen based on the traits or prior exposure to the topic (Matthews & Ross, 2010). The lecturers teach a course on English for Science and Technology (EST), Technology-Enhanced Language Learning (TELL), and Digital Literacy on ELT (DLE). They are from two distinct universities' departments of English Education. Lecturer 1 (L1) and Lecturer 2 (L2) are affiliated with the same university, whereas the other one (L3) is not.

The observation (Creswell, 2003) was conducted on the lecturers' Canvas discussion boards, where it

was possible to witness how the AODBs were created and how the lecturers made the most use of the discussion board's features to conduct asynchronous online discussions. Observations were conducted within five distinct discussion boards on the Canvas LMS. Each of which was set up by individual lecturers. This led to the in-depth examination of a total of 15 Canvas discussion boards, serving as a valuable source of comprehensive insights into the affordances offered by Canvas for AODB. The lecturers' standpoints dealing with the optimization of Canvas LMS as AODBs' mediator were lumped through semi-structured interviews. To elicit the lecturer's points of view on the practices, merits and issues of adopting Canvas as AODBs' agent, semi-structured interviews (Rabionet, 2011) were then administered. The interviews took place in a secure environment involving two instructors from the same university, with a duration approximately 20 minutes each participant. An equivalent interview duration was maintained for an online interview via Zoom, engaging a lecturer from a separate university situated at a considerable distance from the researchers' academic institutions.

Data from interviews and observations were combined, evaluated for mostly-utilized Canvas features, and thematically categorized for the AODBs' affordances and constraints. This was done under the aegis of the technology affordance framework.

## RESULTS AND DISCUSSION

### *Lecturers' usage of canvas discussion features to set up AODBs*

Four major Canvas features optimized by lecturers for setting up AODBs were discovered from 16-week observations to 15 lecturers' Canvas discussion boards. They are the instruction page, settings, search entries for authors, replies and likes. As guided by the technology affordance framework, these features led this study to catalog the affordances and constraints of Canvas-driven AODBs experienced by the lecturers (see Figure 1).

### *The instruction page*

Canvas instruction page serves as a user-friendly workspace wherein users can compose detailed information and prompt discussion activities. It is designed like Microsoft Word and allows users to insert media, edit, view, format, tools, tables, etc.

L1, for instance, created discussion instructions in her EST course (see Figure 2). She formatted the text in bold, italic, and underline formats and color-coordinated it to emphasize a must-do activity.

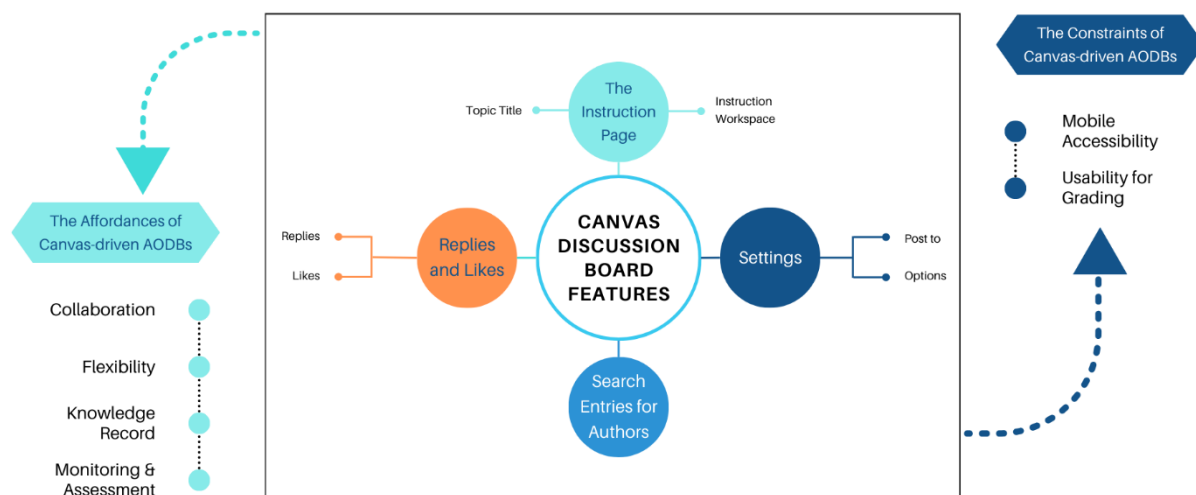


Figure 1. *Canvas-AODBs affordances and constraints*

Moreover, this Canvas feature also promotes multimodality. One instance is one L3's AODB in his DLE course (see Figure 3) where he embedded Genially game and music in the workspace. With this discovery in mind, Canvas-driven AODBs can leverage lecturers' digital literacy. This is as they are adept at seamlessly embedding various technological tools within Canvas discussion boards.

Notably, Canvas workspace signifies lecturers to be inventive when crafting unique educational activities on AODBs. Fundamentally, the AODBs can mediate various educational practices, such as dialogue, reflection, knowledge building, and self-evaluation (Gerosa et al., 2010; Kayler & Karen, 2007). This study thus observed these activities

designed by L1, L2, and L3 within their Canvas discussion boards.

All Canvas-driven AODBs created by L1 in her EST course were typically designed in a knowledge-building manner. It is possible to think of "knowledge creation" as being equivalent with knowledge building (Scardamalia & Bereiter, 2021). In this context, the students are urged to consider critically and improve upon ideas related to a particular learning topic. As depicted in Figure 2, L1 commenced by formulating thorough prompts that instructed students to evaluate the assigned learning resources, address questions/prompts, and subsequently assess their peers' responses. L1 frequently provided model answers to encourage students' engagement.

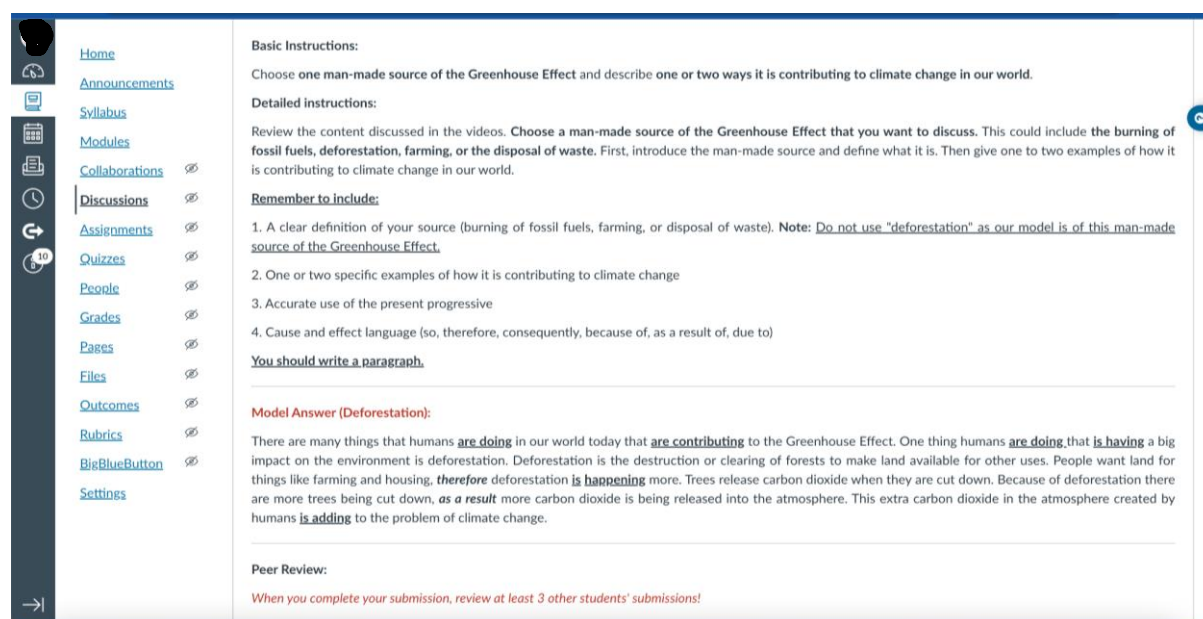


Figure 2. *L1's Canvas instruction page*

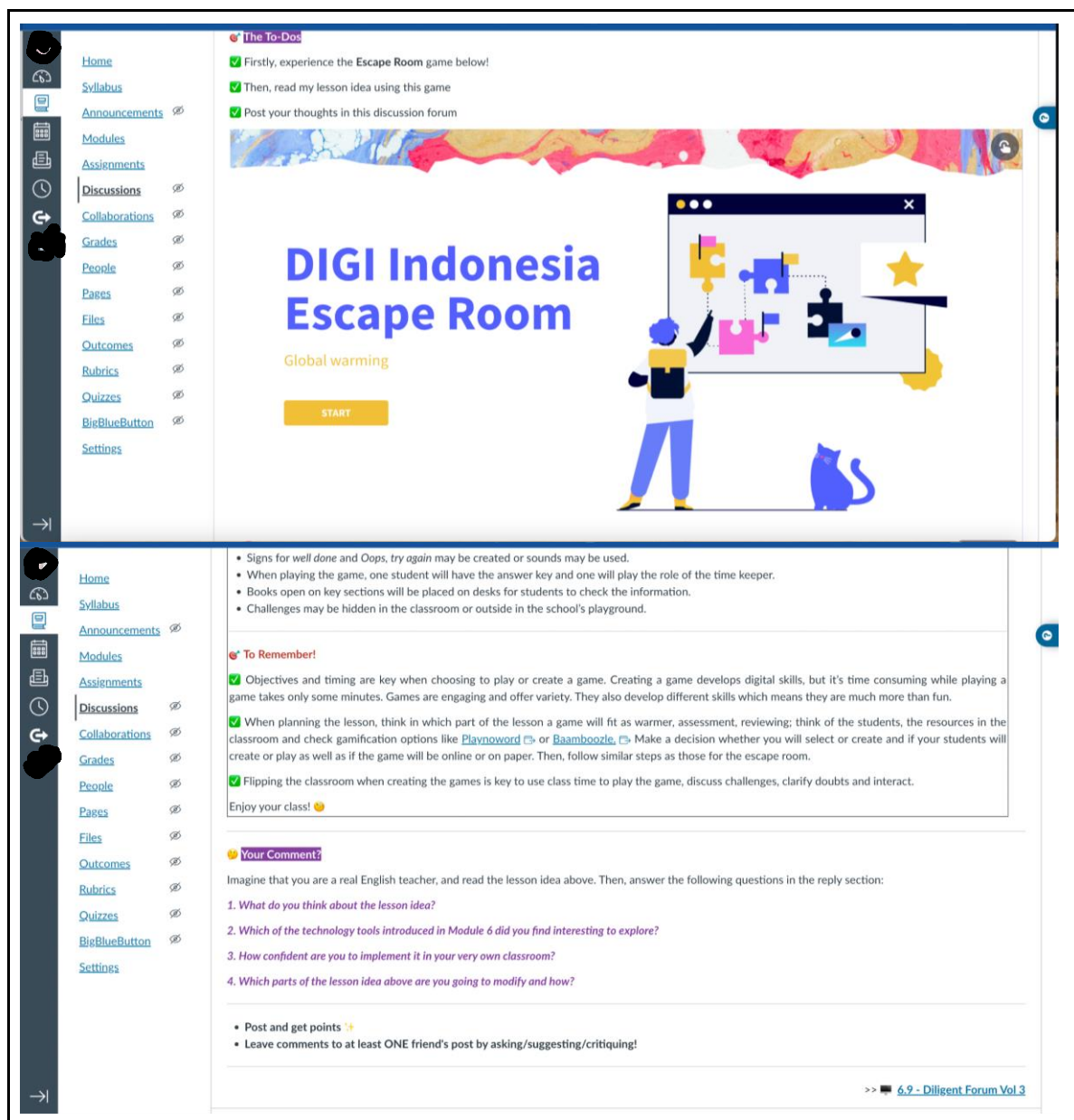


Figure 3. L3's Canvas instruction page

While L2 and L3 predominantly favored “knowledge-building” AODBs, they also ventured into the design and implementation of other educational practices within AODBs. One L2’s Canvas discussion board was designed in a reflection-based manner. This allows students to reflect on a particular topic, share, and discuss their thoughts/reflections, respond and provide suggestions to one another’s reflection results. L2’s innovative discussion activity led to higher student engagement, evident through increased students’ replies (see Figure 4). This finding answers the challenge given by prior research regarding increasing student engagement in asynchronous online learning (Martin & Bolliger, 2018).

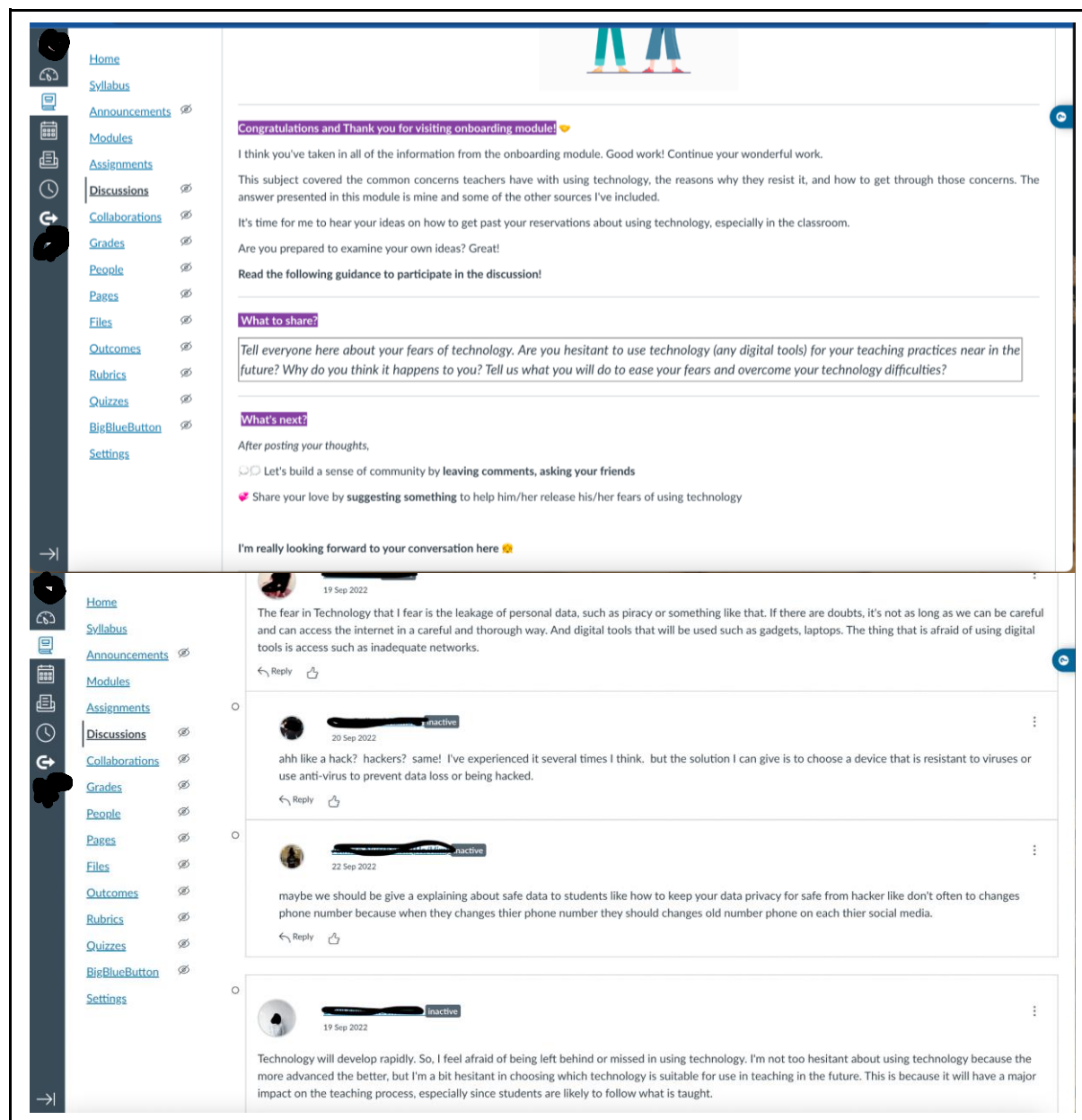


Figure 4. L2's Canvas instruction page

Compared to L1 and L2, L3's AODBs educational practices were more diversified. Aside from knowledge-building and reflection, this study discovered an AODB self-evaluation mode from L3. Along with his interesting workspace design, L3 crafted instructions in a

dialogical and encouraging style. He invited students to express their thoughts and emotions following the modules comprehension. This was succeeded by some typical self-evaluation queries to share in the forum (see Figure 5).



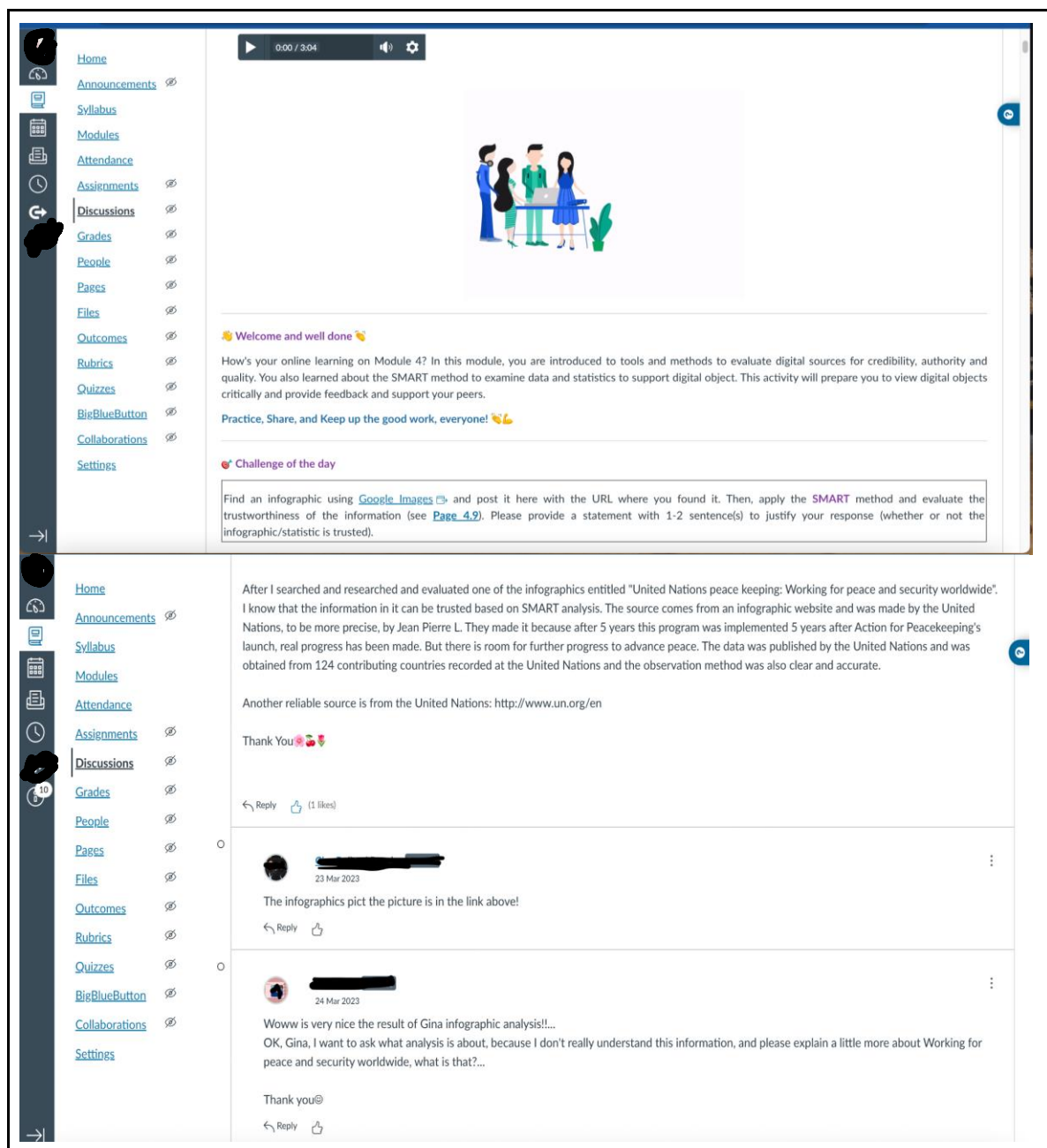


Figure 5. L3's Canvas instruction page

The students actively participated in the discussion forum. Only two students out of 29 did not appear and post anything. This discovery also endorses AODBs' support for increasing student engagement. Enhanced student engagement has been demonstrated as a potential mechanism for mitigating attrition rates by fostering stronger connectedness and diminishing feelings of isolation among students (Collins et al., 2019). The observations on the instruction page promotes the value of lecturers' digital literacy to construct asynchronous online learning environments. It underlines the vitality of lecturers' ability in exploring and optimizing the technology features.

#### Settings

This feature lets users manage the discussion flow. There are two essential sub-features users must work on: "Post to" and "Options" (see Figure 6). The lecturers in this study made this discussion available to all students enrolled in each course. This study interprets this as lecturers' attempt to value students' individual responsibility and right to complete the task at hand. This discovery satisfies fundamental adult learning theory that students should take responsibility in shaping their learning and steering the online learning experience (Koehler et al., 2020).

The study then reveals that all lecturers have already followed the nature of AODBs by enabling threaded replies in the Option setting (see Figure 6). A “thread” is a single topic of discussion, the name of which appears in the

subject line of all postings related to it (Kirk & Orr, 2003). Additionally, lecturers can impose participation rules on Canvas-driven AODBs, requiring students to post responses before seeing others’ ones.

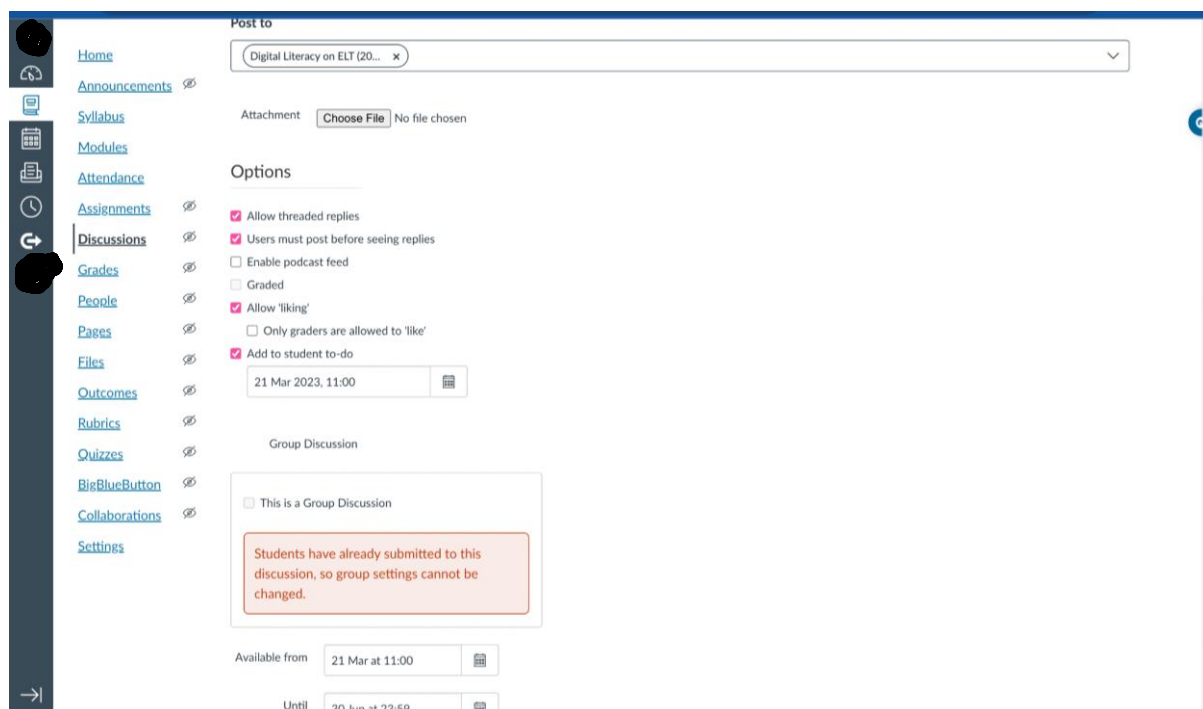


Figure 6. *Canvas discussion board settings*

This study argues that Canvas supports autonomous learning through AODBs, promoting critical thinking and collaboration (Garrison & Anderson, 2003), as crucial aspects in HE.

Still in the “Option” setting, there are other important sub-features. There are “Enable Podcast Feed”, “Graded”, “Allow Liking”, “Add to Student To-Do”, “Group Discussion”, and “Discussion Period”. This study discovered that all lecturers did not activate the “Enable Podcast Feed” function even though this will make the discussion prompt more multimodal. This sub-feature basically allows users to insert a podcast feed for the discussion topics. A podcast is a way to distribute digital content for download on the internet. A podcast feed is the file the users can use to distribute the discussion for participants who want to subscribe through external podcasting channels (Canvas Instructure, 2023).

Another configuration for an AODB is a graded discussion. From the observations, only L2 turned on this sub-feature in her three AODBs. When this is activated, users can assign points to the students’ responses by operating the “SpeedGrader” button embedded in Canvas.

Activating graded discussion mode may make students feel accountable for contributing to the discussions, as lecturers prompt responses. This does not, however, ensure active involvement. From L2’s AODBs, this study reveals that the students only post required tasks without engaging in dialogic conversations. This led to no replies given to peers’ posts, urging lecturers to address this issue (see Figure 7).

Moreover, this study discovered that all lecturers activated the features “Allow Liking”, “Add to Student To-Do”. By ticking “Allow Liking” from this setting feature, the students will see a “like” button symbolized by the hands up and down. This acts as a non-text response the students can give in the discussion page. Then, all lecturers in this study turned on “Add to Student To-Do” to notify students about the new topic discussions. They also favored individual responses - a feature offered by Canvas. Due to subject-based syllabuses, which provide students new lesson topics each week, lecturers in this study also scheduled discussions over the course of a week.



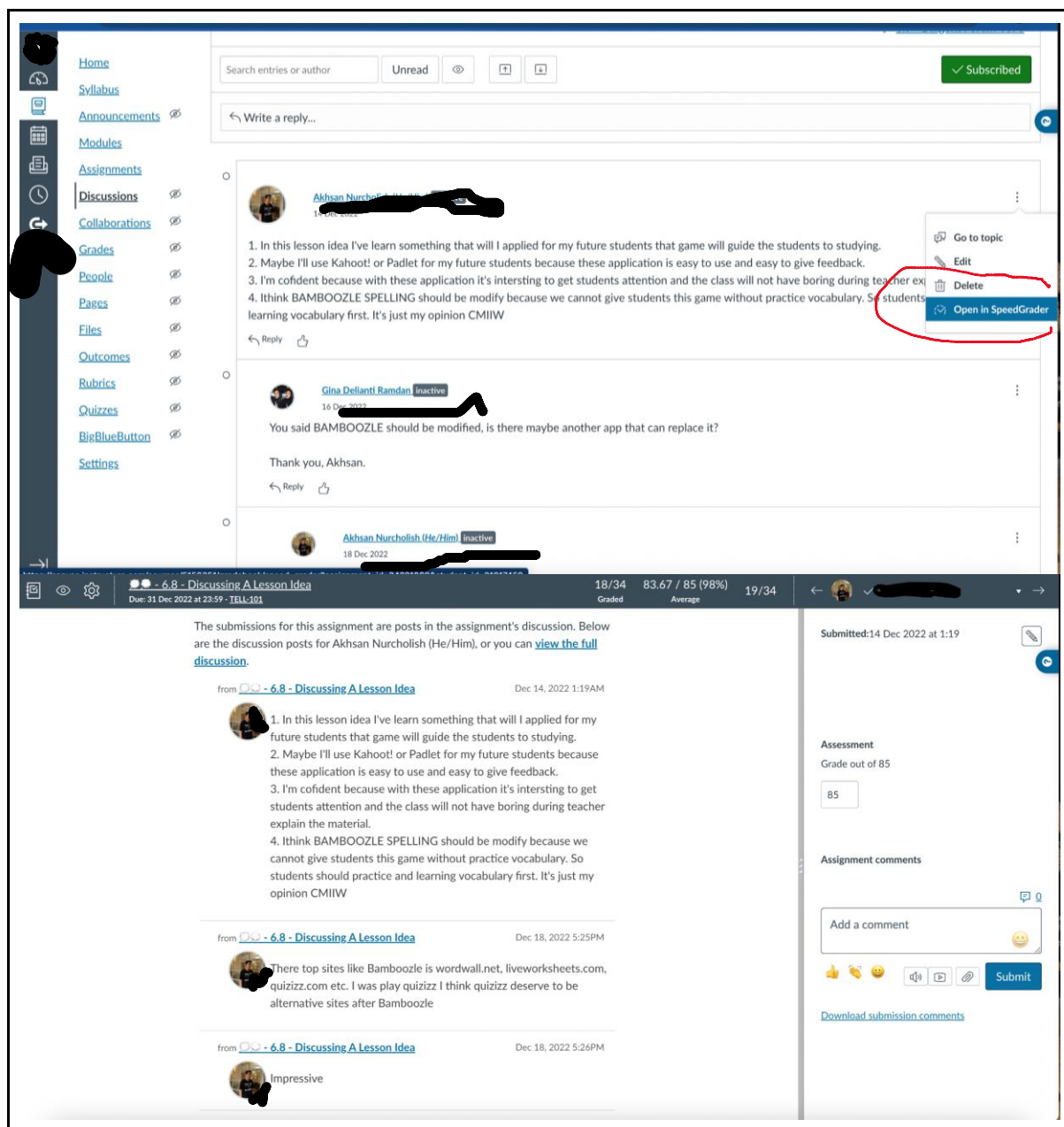


Figure 7. L2's Canvas speedgrader

#### Search entries for authors

The next feature of Canvas driven AODBs mentioned is the "Search Entries for Authors" feature. This feature becomes visible when users configure their discussion settings and the discussion platform is ready to receive input. In terms this capability allows administrators to find participants by entering their names into the search box provided. Essentially it works like a

search engine. This proves useful when there are many participants involved in the conversation.

Results from our research highlight how extensively L2 utilizes this feature thanks to her graded discussion system. This functionality greatly simplifies the evaluation process by eliminating the need to manually go through all the responses in the discussion board.

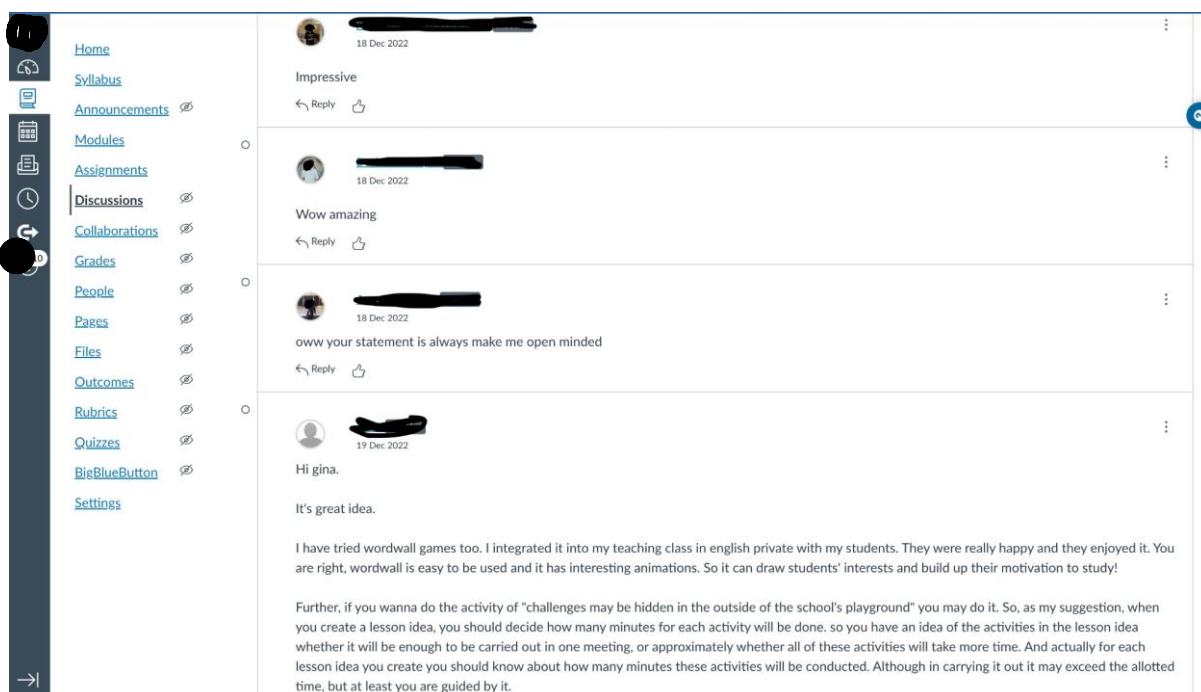


Figure 8. *Students' feedback*

L2 simply inputs each student's name, which immediately identifies their contributions to the discussion. In this context, the integration of this Canvas feature notably expedites the task of overseeing individual student engagement levels within the realm of AODBs.

#### *Replies & likes*

The "Reply & Likes" feature is the pinnacle of Canvas's functionality for encouraging asynchronous discussion activities. Similar to the aforementioned "Search Entries for Authors" function, this option becomes available after the discussion board setup is complete. Within the discussion board, the "likes" and "replies" buttons are situated beneath each student's post. The "likes" button gives students a way to provide comments without using text. The "replies" button, on the other hand, allows students to provide detailed comments or feedback in text form.

The practical evidence supports the effectiveness of this feature in increasing student engagement during discussions. The visual representation (see Figure 8) demonstrates students who have received feedback in the form of likes and replies, encouraging them to respond and provide personalized and constructive feedback on their peers' responses. These observations are consistent with the research by Iraj et al. (2020). They assert that personalized feedback on posts is essential for raising students' levels of involvement in the future.

Hence, it is strongly advised that lecturers incorporating AODBs proactively incorporate targeted guidelines for students to engage in reciprocal commentary on their peers' contributions. Lecturers may think about imposing limits on the number of responses in order to allay potential concerns about the necessity of giving feedback for each individual response. A technique that takes cues from L1, L2, and L3 practices arises in which each student is instructed to provide feedback only to the posts of a select 2 to 3 peers.

#### *The affordances and constraints of Canvas-driven AODBs*

The abovementioned Canvas features led this study to lump together the interview data from three lecturers into four affordances of Canvas-driven AODBs (consisting of *collaboration*, *flexibility*, *knowledge record*, and *monitoring and assessment*) and two constraints (*mobile accessibility* and *usability for grading*). The disclosure of Canvas-driven AODBs' affordances and constraints may introduce some brand-new details to the realm of discussion in education.

#### *Collaboration*

Canvas-driven AODBs in HE has offered a multifaceted set of affordances, and one of them is to enhance collaboration. Collaboration emerges as a pivotal element in fostering meaningful online discussions. The Community of Inquiry (CoI) structure put forth by Garrison, Anderson, and Archer (2001) is in line with this.

This CoI framework asserts that social presence, which is solely student collaboration and interaction, fosters cognitive presence, one of its vital components (Hasani, Santoso, & Junus, 2022). In the interview session, L1 highlighted this aspect (see L1's excerpt).

Furthermore, this collaboration affordance enabled by Canvas-driven AODBs promotes active engagement and critical thinking development. This is consistent with the supposition of Garrison and Anderson (2003) AODBs may promote critical thinking and collaboration. This point was stressed by L3 in his interview. He believed that his students' critical thinking and engagement got increased when he used Canvas for asynchronous online discussions. He remarked that this could happen in the way his students engaged in the discussion by asking queries and building each other's thoughts (see L3's excerpt). Canvas-driven AODBs, with their threaded discussion format, also embody Vygotsky's idea of the Zone of Proximal Development (ZPD), where learners can scaffold their understanding through collaboration with peers (Chun & Cennamo, 2022).

L1: I love Canvas. You know that Canvas can make my students engaged in the discussion, even though it's asynchronous. So I think the Canvas discussion board is like a virtual classroom where students can collaborate, share documents and learn the resources together.

L3: Since I used Canvas for asynchronous online discussions, I always experimented with its features and tried to design different discussion activities each week. I believe that my students can do peer-to-peer learning on Canvas discussion boards. So far, many students actively participated in the discussions, asked questions, and built on each other's ideas or opinions.

These interview data exemplify how Canvas discussion features harness collaborative potential. Consequently, this study posits that Canvas-driven AODBs can enrich learning experience in HE by promoting dialogue, critical thinking, and knowledge construction among students.

### *Flexibility*

Flexibility in asynchronous online learning is critical. This is consistent with the adult learning theory's central tenet that learning should be self-directed and should be adapted to each person's schedule and preferences (Loeng, 2020). To this

point, L2 illuminated this aspect in Canvas-driven AODBs that she created (see L2's excerpt).

Moreover, the flexibility offered by Canvas-driven AODBs extends the asynchronous nature of discussions. This enables students to engage with course content and their peers without the constraints of real-time interaction (Danaher et al., 2021). L3 echoed this notion stating that her students always re-considered and reflected on their prior knowledge before posting their responses to the discussion board. Her students felt this way of learning was more convenient for them since they were away from being pressured to fulfill the task immediately (see L3's excerpt). Some scholars have already identified these AODBs' potentials (e.g., Wu et al., 2013; Putman, 2012). This discovery demonstrates how Canvas-powered AODBs provide a flexible space for thoughtful and deliberate engagement, reducing the transactional distance and promoting active learning.

L2: Of course. Canvas has specific features to set the discussion period. I usually set up a 1-week discussion. And yes, they can pop up in the discussion anytime and anywhere they are convenient. It is as long as they meet the discussion due. I think this flexibility will accommodate diverse students' learning styles. You know every student is unique. With no real-time pressure, they can be themselves in learning the topics, exploring the resources, and expressing ideas.

L3: After I conducted asynchronous online learning using Canvas discussion boards, I got positive feedback from my students. They said to me that this type of online learning allows them to think and reflect on the answers first before posting to the discussion forum. I personally think this is enough to prove that online learning on AODB is crucial for deepening understanding. I understand that AODBs on Canvas can remove the pressure of immediate responses, making the discussions more meaningful. Of course, for my students.

The flexibility afforded by Canvas-driven AODBs enables both lecturers and students to immerse in the discussions at their own pace, space, and convenience. Canvas-driven AODBs accommodate diverse learning styles and schedules. To this point, lecturers are urged to create a low-pressure online environment to encourage deep engagement and meaningful interactions.

### *Knowledge record*

The other Canvas-mediated AODBs' affordance is knowledge record. With this affordance, lecturers are assisted to track and archive students' responses for later review and grading (Dailey-Hebert, 2018). L3, in his interview, provided insights into this aspect noting,

L3: To me, Canvas discussion boards serve as a repository for my students' contributions and learning progress. This not only helps me with reviewing and revisiting discussions, but also tracking an individual's learning progress over time.

This finding highlights how Canvas supports knowledge preservation. With the technology support, lecturers' archiving skills and efforts are well-mediated. This will help preserve students' learning progress, encouraging accountability, governance, and societal wisdom (Mosweu & Ngoepe, 2019). In summary, this affordance leads this study to claim that Canvas-driven AODBs can encourage the documentation and preservation of knowledge in the digital age.

### *Monitoring and assessment*

Monitoring or assessment exhibiting flexibility in terms of schedule/due date and content stand out as a potent catalyst for boosting student engagement (Osborne et al., 2018). This study proves that Canvas-driven AODBs encapsulate this specific affordance, empowering lecturers to gauge students' participation, engagement, and learning progress. It is imperative to acknowledge that this affordance harmonizes seamlessly with the fundamental principle of formative assessment (FA), a pivotal element of effective teaching and learning. Notably, discussions represent prominent FA techniques to assess understanding and rectify misconception (Elmahdi, Al-Hatami, & Fawzi, 2018). It is thus rational to assert that AODBs inherently encompass this affordance.

The lecturers consequently play a crucial part in properly utilizing technological elements to track students' engagement, particularly in the virtual setting like Canvas-AODBs. As articulated by L2 during the interview,

L2: I can track students' participation and learning progress in Canvas discussion boards. There is a feature named "Search entries for authors". I use this feature a lot to search students' individual responses in the discussion forums. It helps me when it comes to a graded discussion. I don't need to scroll down and

waste my time, I just enter a student's name on this feature, then select his/her responses, and do assessment. That's how I monitor my students. With the help of this feature, I can track who is actively participating, who might be struggling, and even identify emerging trends in the discussions.

AODBs also suit the tenets of the Community of Inquiry (CoI) notion (Hasani, Santoso, & Junus, 2022). This is by facilitating the monitoring of social presence within AODBs. L1 elaborated on this by noting,

L1: Through Canvas, I can assess the quality of interactions among students. I usually look for signs of meaningful discourse and collaboration. You know how each student uses the dialogic words when they comment on their peer's posts, or even how many likes students get. That's a simple thing but it matters to me to understand their relationship. I think this is one of the key components of building a sense of community in online learning.

From this discovery, Canvas-driven provide lecturers with crucial monitoring and assessment affordances, enhancing pedagogical effectiveness in HE. This enables lecturers to adapt strategies and provide timely support based on insights gained through Canvas features.

### *Mobile accessibility*

The mobile accessibility constraint, as revealed by L1 (see L1's excerpt), sheds light on a significant issue faced by lecturers when using Canvas LMS via mobile devices.

Mobile accessibility in LMSs is a crucial aspect of modern education in HE (Gupta, Khan, & Agarwal, 2021). It allows lecturers and students to engage with course materials and activities on-the-go. L1's experience aligns with the findings of research on mobile learning in HE. To Ally and Tsinakos (2014), mobile learning can be hindered when educational platforms and tools are not optimized for mobile access. In the case of Canvas, while it offers a mobile App, the constraint L1 encountered may be indicative of a gap in the app's functionality and user-friendliness. The existing Canvas App for Teacher is primarily tailored for the purpose of reviewing data that have already been entered by educators via the Canvas website version. The app version is as opposed to serving as a comprehensive platform for the creation and input of new learning resources. This discovery might become

authentic feedback for the Canvas App for Teacher developer.

L1: I find the Canvas App for Teacher inconvenient for me. I cannot set up a discussion board on it. Still, I must always use my laptop or ipad to open my Canvas account. Sometimes I am away from my laptop and ipad, and still have to create discussion boards. Yeah... When I was on the go and had no laptop with me around, I had to use my cell phone and opened my Canvas account (website version) from Google Chrome. It is too small, please. It's kind of useless to have the mobile app version on my phone if this happens again to me. I hope the mobile app version is updated soon, so it will be easier for me and other educators who are using Canvas to create everything directly from Canvas App, no need to use website version anymore.

The mobile accessibility constraint identified through L1's experience underscores the importance of seamless and user-friendly mobile access to an LMS like Canvas. Addressing this constraint is crucial to ensure that educators can efficiently manage their courses and access essential features of Canvas on mobile devices, especially when they are away from their laptops or desktop computers.

#### *Usability for grading*

The usability constraint uncovered in L2's interview data highlights a significant challenge by lecturers when utilizing the graded discussion feature in Canvas LMS. Usability issues can profoundly affect the efficiency and user experience of educational technology platforms. In this case, L2's initial struggle to grade students' responses in Canvas is indicative of a usability challenge within the system.

In addition to that, L2's discovery of the solution by exploring buttons on Canvas discussion board, including the "SpeedGrader" option, highlights the importance of user support and training. Effective training and support resources are essential for educators to navigate and utilize the features of an LMS successfully.

L2: As you may be aware when you previously observed my Canvas discussion boards, I always use graded discussions, right? I had a funny story about this. At the very first time I activated this graded discussion feature, I didn't know how to write grades to my students' responses in the discussion forums. I ended up not including any grades in Canvas. I was so

confused and tried my best to explore more Canvas discussion boards. I had to find where the grading box is placed in Canvas. When I was stuck, I read articles on Canvas network websites. I spent hours trying to find the feature. Haha.. With the guide from the article, I finally figured out the three dots besides each student's posts, and the "SpeedGrader" feature. When I clicked on it, daaaaang, the grading box I was looking for was there. I'm proud of myself.

The usability for grading constraint identified through L2's experience underscores the need for user-friendly design and effective user support within educational technology like Canvas. Addressing usability issues is essential to ensure that educators can efficiently use LMS features like graded discussions, ultimately enhancing the overall teaching and learning experience.

#### **CONCLUSION**

This study scrutinizes the roles of Canvas-driven AODBs on lecturers' experiences from the lens of the technology affordance framework. It was possible for lecturers to create AODBs for asynchronous online learning by identifying four Canvas discussion boards' features. The first feature, called "instruction pages," enables lecturers to provide discussion titles and record discussion flow. The settings tool gives lecturers control over the timeline and conversation mode, providing them a comprehensive picture of the student experience. Lecturers can monitor individual student answers and engagement by using the "Search entries for authors" tool. Students can provide each other feedback using the "replies and likes" capabilities. These features prove to be helpful for developing, organizing, and implementing AODBs for asynchronous online learning.

The aforementioned features have contributed to shape the lecturers' experiences in running Canvas-driven AODBs. Lecturers have benefitted from four aspects while facing two constraints. Canvas-powered AODBs enable students to collaborate, complete tasks at their convenience, archive participation and learning progress, and monitor as well as assess students' achievement through features like "Search Entries for Authors" and "SpeedGrader." However, Canvas's mobile version limits lecturers from creating and designing AODBs, and some users may struggle with the "SpeedGrader" feature to grade students' responses. To address these issues, user support and training are recommended.



All in all, lectures should give Canvas-driven AODBs a try. It has been proven that Canvas's features facilitate asynchronous online learning through AODBs. In light of this, this study provides novel convincing proof that introducing asynchronous online learning in HE is worthwhile. As a result, lecturers play a vital role for establishing a valuable and engaging asynchronous online learning environment. To use the majority of the LMSs' features like Canvas, an instructor must be digitally literate.

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