

Paper Number:

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AN INVESTIGATION INTO THE EFFECTIVENESS OF DISCUSSION BOARDS IN WORK-BASED LEARNING

ABSTRACT

Work-based learners (WBLs) in the Higher Education (HE) setting, including those on placements, internships, and degree apprenticeships, can face challenges surrounding isolation and alienation due to their hybrid and remote mode of learning, and subsequent lack of social interaction. A prominent tool to address this is the discussion board, an online platform to supplement or replace face-to-face conversations. While current literature has explored discussion board usage amongst some learning communities, a gap remains amongst others, including WBLs.

Addressing this gap, this action research evaluates discussion board usage by WBLs through the lens of Chartered Manager Degree Apprentices (CMDAs) studying at Staffordshire University. 15 participants engaged in discussion board activities before taking part in focus groups to capture their experiences. Captured data was then subject to reflexive thematic analysis via the innovative use of ChatGPT 3.5.

Findings highlighted the potential of discussion boards to enhance knowledge sharing and community building amongst WBLs. Good practice is established in relation to group size, design and facilitation, and the role of facilitators in motivating participants. Common pitfalls such as lack of training, accessibility issues, clunky systems are identified.

A framework for discussion board excellence in WBL is proposed, in addition to recommendations surrounding curriculum integration, awareness of benefits, training and ongoing technical support, and active facilitation. Future research could look to repeat the study on a larger scale, across multiple institutions, testing the proposed framework.

Keywords: Work-Based Learning, Apprenticeships, Discussion Board, Online Pedagogy, Generative Conversation.

1. Introduction

1.1. Context

Work-based learners (WBLs), professionals participating in practical training delivered by an education institution and an employer (Maguire et al., 2019), often work at a distance, self-managed, as part of a community of practice (Taousanidis and Antoniadou, 2008). WBLs are typically mature, aged 25-65 (Yamashita et al., 2022), and face challenges surrounding the use of I.T (Posadas, 2023), isolation and alienation (Robinson, 2018), and social interaction and motivation, as a result of hybrid or distance learning (Behal et al., 2023; Rowe et al., 2016). In the higher education (HE) setting, WBLs can include placements, internships, and apprenticeships (Mapletoft, 2020), including the popular Chartered Manager Degree Apprenticeship (CMDA) in the UK context (IfATE, 2024).

A prominent tool used in hybrid and distance learning is the discussion board (Dalelio, 2013), an online platform to facilitate peer-to-peer interaction, and supplement or replace face-to-face conversations (Champion and Gunnlaugson, 2017). This is a significant research area dating back to the 1990s (Covelli, 2017; Zhou, 2015), with previous studies showing that discussion boards can be effective in encouraging communication (Buil et al., 2012),

facilitating collaboration (Halabi and Larkins, 2016), and creating a sense of community (Mazurowski, 2023).

While such studies show the positive impact of discussion board usage on general student performance, there is a dearth of research on their effectiveness amongst specific groups, for example, WBLs (Halabi and Larkins, 2016). This is reinforced by Alwafi (2023: 89), who calls for a need to replicate discussion board studies amongst “other populations of online learners.” Therefore, the objective of this paper is to contribute to this gap by evaluating discussion board usage amongst WBLs, through the lens of UK CMDA apprentices.

1.2. Research Objectives

1. Examine the impact of discussion boards on knowledge sharing within a WBL community.
2. Evaluate the role of discussion boards in fostering community building amongst WBLs.
3. Investigate the design and facilitation of discussion boards in the context of WBL.
4. Develop a conceptual framework and subsequent recommendations to improve the overall experience of discussion board engagement amongst WBLs.

2. Literature Review

2.1. Approach

To explore WBL through the lens of UK CMDA, a Boolean search string of "discussion board" or "forum" and "apprentice," and a date filter of five years (2019-2024), was used to browse Scopus, EBSCO, Directory of Open Access Journals, JSTOR, and ProQuest for pertinent literature. In total, 29 results were identified, and their respective titles and abstracts scanned for relevance. 23 results were excluded, of which, reasons for exclusion included reference to

'boards' in other contexts, such as boards of directors, and reference to 'forums' in contexts other than education, such as fan fiction websites. After the aforementioned screening process, six results remained and formed the spine of the literature review.

The lack of literature pertinent to discussion board usage in WBL reinforces the aforementioned research gap. However, as six pieces of literature was not enough to conduct a comprehensive literature review, the search was widened to Google Scholar, with a 10-year filter, to include a range of additional sources exploring the application of discussion boards in the wider context of HE. This literature review subsequently identified five emerging themes of group dynamic, engagement and interactions, motivation, design and facilitation, and criticisms and barriers.

2.2. Theme 1: Group Dynamics

The size of a discussion board group emerged as a key factor. Traditional theories such as McGrath (1984) suggest the optimal size for a group may be five to seven members, as this number is small enough to mitigate communication challenges, whilst being significant enough to achieve diverse viewpoints. This reinforces Miller's (1956) focus on the 'magical number seven.' Tuckman (1977), on the other hand, does not put a number on it, but states smaller groups are able to navigate through the stages of forming, storming, norming, performing, and adjourning more quickly, as closeness equals improved interpersonal relationships. Similarly, Hackman (2002) emphasises the importance of member ability and the nature of the task in determining optimum group size, again, not providing a fixed number.

Pertegal-Felices et al. (2011) put such traditional theories to test by utilising a discussion board with an engineering degree group of 100 students. They achieved positive results which counteracted previous negative achievement trends. The implementation was seen as an innovative way of navigating the 'impossible' target of providing personalised

learning with limited resources to a large group. Despite this, a criticism of this study is the reference to laboratory groups of 20-25, but lack of clarity as to whether this sub-group setup was used for the discussion board too.

Considering anonymity amongst groups, Connell (2023) refers to Colton and Hatcher's (2004) creation of a web-based discussion board, in which participants were given pen names and were able to openly converse and add additional commentary to a rich discussion, resulting in more in-depth content validation. This, therefore, suggests contributions should be anonymised.

2.3. Theme 2: Engagement and Interactions

Dalelio (2013) categorises students by how they engage with discussion boards. Starters ignite the spark by initiating a conversation, introducing topics, and posing questions. Responders reply, offer insight, and build on existing discussions. They are key to sustaining dialogue. Activators trigger deeper exploration via probing questions and challenging assumptions. Meanwhile, latecomers miss the initial buzz but still contribute valuable perspectives. The source found that the more students engaged with the discussion board, the higher their grades. They also found students categorised as starters and responders achieved higher grades than activators and latecomers. Furthermore, they categorise the 'original' post (opening question) as either an invitation, exploration, concept invention, or application.

Champion and Gunnlaugson (2017) also explore engagement dynamics, concluding that, in an age of increasing online higher education (Allen and Seaman, 2015; Schneller and Holmberg, 2014), generative conversation models such as a combination of Kantor's (2012) Four Players model and Scharmer's (2009) Four Fields model (Figure 1), can be used by participants for more transformative engagements in boards.

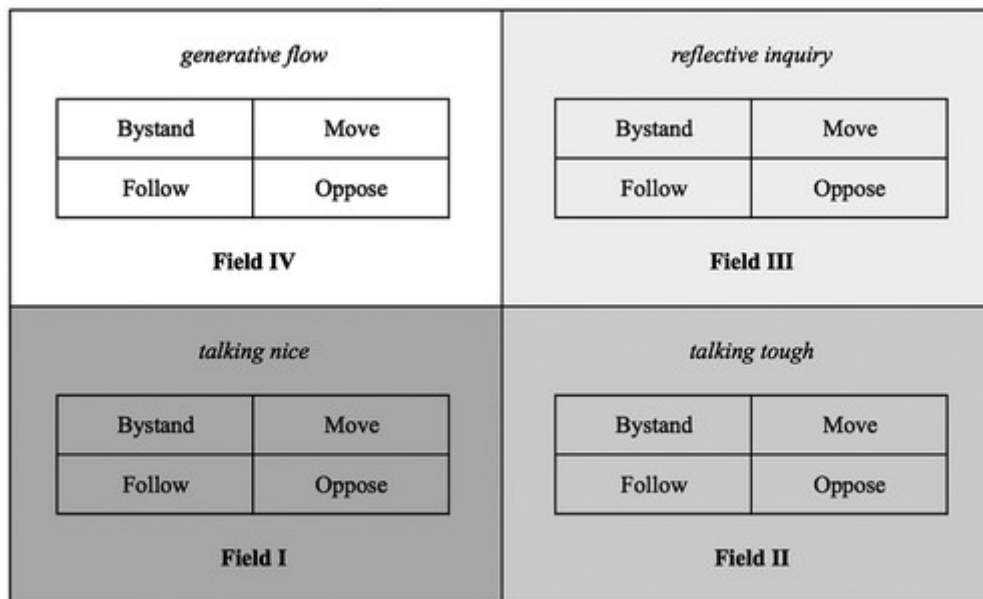


Figure 1. Kantor's (2012) Four Players, in Scharmer's (2009) Four Fields (Champion and Gunnlaugson, 2018).

Covelli (2017) describes the large amount of research surrounding discussion boards and the continued failure to use them effectively. Zhou (2015) elaborates on that 'large amount of research' by noting foci of participation (Brooks and Bippus, 2012), interactions (Celik, 2013), community building (Guilar and Loring, 2008), learning outcomes (Zhan et al., 2011), and identities (Bryce, 2007).

The source's study concludes a holistic process - a progression framework of internet-mediated discussion as part of coursework in HE settings (Figure 2). It may be argued this could be effective in the WBL context since the source states "when studies conducted in such diverse contexts report similar findings, it is reasonable to consider that similar findings have a high probability of existing in other contexts" (Zhou, 2015: 194).

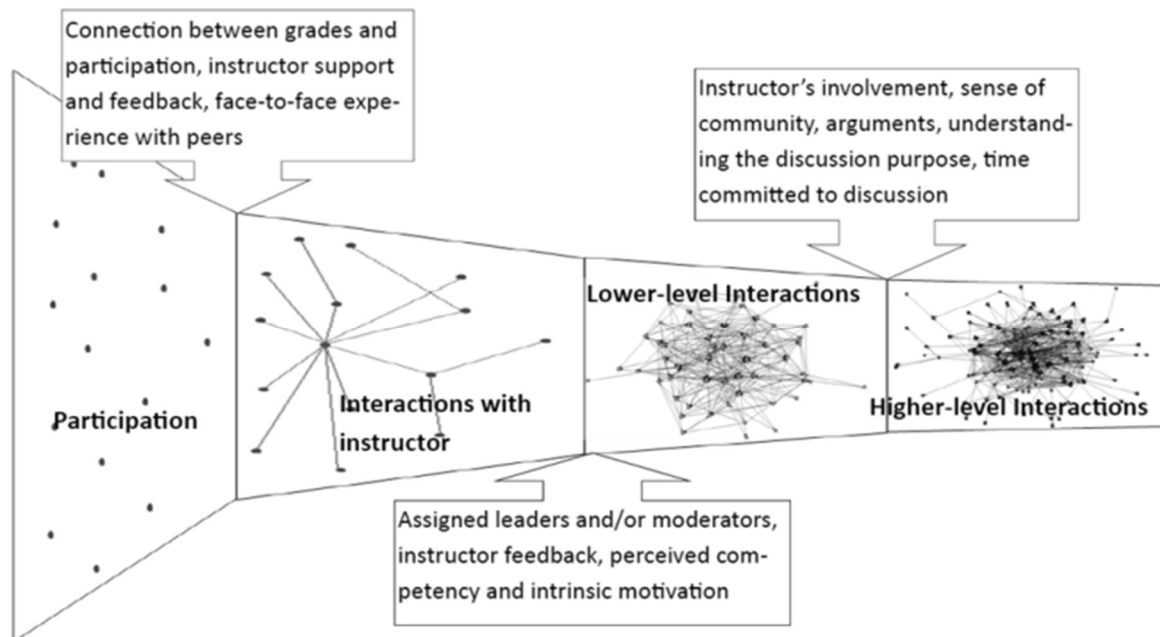


Figure 2. Holistic process of internet-mediated discussion (Zhou, 2015).

2.4. Theme 3: Design and Facilitation

In this section, the recommended design and facilitation of discussion boards is considered. Curaj et al. (2020) state that shared goals and a sense of cohesion do not emerge solely due to the implementation of a discussion board, instead, the design and facilitation of learning activities within them must foster a sense of community. Within, they note an example of this, Aronson's Jigsaw approach (Pai et al., 2015), where sub-groups explore sub-topics, then return to the main group to contribute to wider understanding.

Reinforcing Curaj's (2020) point about the importance of learning design when using discussion boards, Oppl and Stry (2019) refer to the need for a prepared environment (Figure 3). This source refers to the progressive education approach, and the subsequent Dalton Plan (Weichhart, 2012; Parkhurst, 1922), which incorporates discussion board activity.

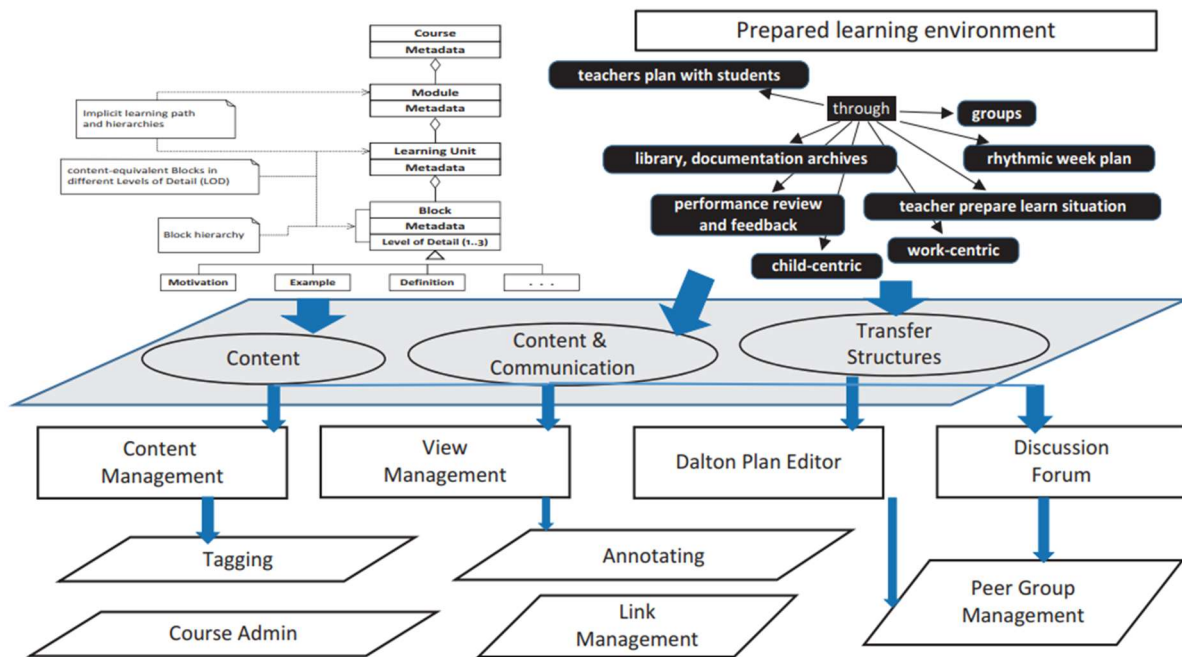


Figure 3. Dalton Plan (Oppl and Stary, 2019; Weichhart, 2012; Parkhurst, 1922).

An alternative to the Dalton Plan is the Cognitive Apprenticeship Model (CAM).

Considering WBL curriculum design, the CAM comprises components of modelling, coaching, scaffolding, articulation, reflection, and exploration. It emphasises the importance of social interaction in the learning process (Collins et al., 1989). Alwafi (2023) refers to discussion boards as a feature of cognitive apprenticeships, explaining that effective online environment design and appropriate student network size are key contributors to inter- and intra-group interaction.

Morley and Jamil (2020) present a case study of this in action, in which students are required to deliver a 12-minute recorded presentation on an online discussion board thread. They then manage their own thread related to their presentation and make contributions about three other students' presentations in their peers' threads. This allows students to gain skills in managing online asynchronous conversation.

2.5. Theme 4: Motivation

In this section, how to motivate WBLs to engage in discussion boards is considered. This includes motivation to log in, read, and make postings (Sim et al., 2011). Firstly, WBLs in particular are impacted by time availability due to juggling work and study (Sim et al., 2011). Mitigating this, Clinton and Kelly (2020) created an intervention at the beginning of a course, consisting of a short video and essay question to inform students of the usefulness of discussion boards. Whilst their research yielded no impact on performance, it did show the intervention to be effective in improving student attitudes and intrinsic motivation towards discussion boards. Achieving student participation is reliant on this intrinsic motivation, in line with self-determination theory (Xie et al., 2006).

Marett and Joshi (2009) break down the term intrinsic further by defining students as 'posters' and 'lurkers,' who are motivated differently by intrinsic factors. Meanwhile, they refer to extrinsic motivation, as witnessed via reputation and status-building within students' respective communities. Another factor impacting extrinsic motivation is that of discussion board aesthetics, as having straightforward, eye-catching design can drive engagement (Sim et al., 2011).

Elaborating on motivations to engage in discussion boards, Ransdell et al. (2018) state that students ask themselves "is it worth my time?" and "will it help me get a better grade?" when deciding whether to engage. Reinforcing Marett and Joshi (2009), they also distinguish between posters and lurkers, but use the terminology 'active users' and 'passive watchers.' Their key finding is that student motivation to engage in discussion boards is ultimately dependent on the facilitator's ability to motivate them to do so, for example, by deploying thought-provoking simulated questions to stimulate engagement (Markwell, 2005). While making

discussion board posts an assessed element, therefore contributing to overall grade, can drive engagement, this forced engagement is generally not valued by students (Douglas et al., 2019).

2.6. Theme 5: Criticisms and Barriers

Morley and Jamil (2020) cite Patel and Aghayere (2006), arguing that students often learn best from peer interaction, hence a web-based discussion forum is a way of facilitating this, however, in their case study of the Rochester Institute of Technology, few students used the discussion forum. Participation rates did, however, correlate to a positive impact on course grades.

Champion and Gunnlaugson (2017) cite several criticisms of the discussion board format, notably a general absence of responses and feelings not being heard (Webb et al., 2004; Thomas et al., 2002), a culture of message-posting not dialogue (Dennen and Wieland, 2007), the design of virtual boards not promoting conditions for dialogue (Thomas et al., 2002), and boards being used to socialise rather than discuss pertinent topics (Ochoa et al., 2012). To ensure this leads and influences primary research, these factors will be considered in the discussion board setup discussed in subsequent chapter(s).

2.7. Literature Review Summary

Five key themes of group dynamics, engagement and interactions, design and facilitation, motivation, and criticisms and barriers emerged. Common themes included the impact of optimal group size, categorisation of engagement types (starters, responders, activators, latecomers), and the use of generative conversation models. This links to and intrinsic and extrinsic motivation to engage. Prominent academic models included the Dalton Plan and Cognitive Apprenticeship Model.

Research linking discussion board participation to outcomes is mixed, therefore, it remains unclear as to whether this does correlate to an increase in grades. Identified barriers of low participation rates, lack of dialogue, social instead of purposeful use, and design and facilitation limitations will all be considered during the primary research process.

Despite large amounts of research on the topic of discussion boards in HE, there is a continued failure to use them effectively (Covelli, 2017), suggesting a need for further empirical study to establish best practice. Zhou (2015) states that it is 'reasonable' to consider that existing findings have a high probability of existing in other contexts but are not clear on what such contexts that may be. Similarly, although Alwafi (2022) links improved critical thinking to engagement in an online learning environment based on the cognitive apprenticeship model, discussion boards make up a small part of this and it remains to be seen whether this particular variable is impactful. Collectively, this warrants a comprehensive investigation into the impact and effectiveness of discussion board engagement within a WBL community, to understand the nuances faced in such a context.

3. Methodology

3.1. Strategy

This action research (Figure 4) (Lewin, 1946), featuring focus groups, is underpinned by interpretivism and a need to illuminate lived experience in education and trigger articulated theories of teaching and learning in concrete practice (Brinkmann and Friesen, 2018). This work is, therefore, motivated by that of Merleau-Ponty (2012), Husserl (1970), Schutz (1967), and Heidegger (1962), and their exploration of human experiences via phenomenology - "what it means to live, work, play, and learn in our world" (Dall'Alba, 2013: p7).

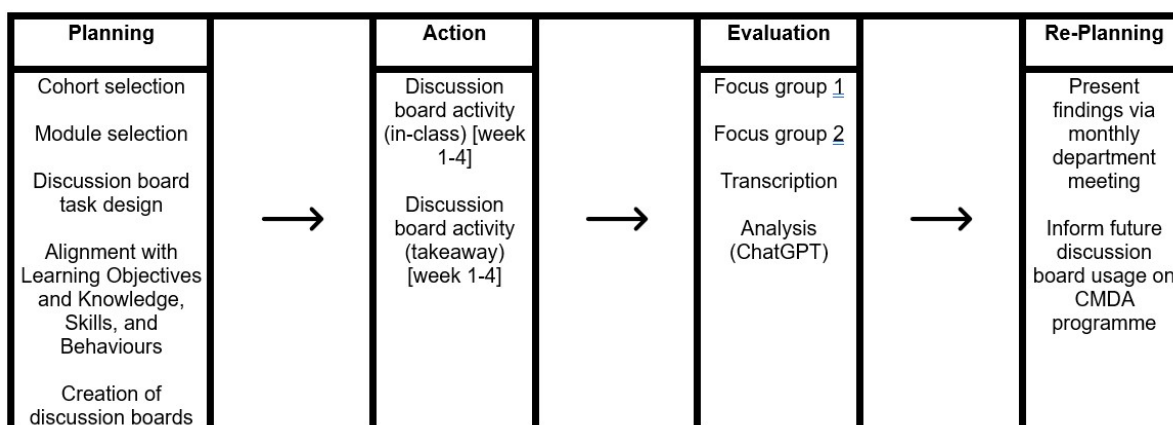


Figure 4. Action research strategy, based on Lewin (1946).

Despite being less rigorous than deductive approaches (Maxwell, 2013), an inductive approach was taken, to provide a rich and nuanced understanding of a complex phenomenon (Creswell, 2013). Flexibility was needed to allow for organic exploration (Charmaz, 2006), given the specific context of WBL and the inability to generalise findings to broader populations (Miles et al., 2014; Gerring, 2007).

Despite mixed methods being ideal for education-orientated research (Newby, 2014), mono-method was chosen to allow for simple design and execution (Babbie, 2016), consistency, and reliability (Maxwell, 2012). The choice of mono-method does, however, limit perspective and potentially overlook important dimensions (Teddlie and Tashakkori, 2009), and reduce validity due to absent triangulation (Creswell and Creswell, 2017).

3.2. Participants

Staffordshire University bolsters a community of approximately 300 WBLs currently studying towards the CMDA, at different stages. They are mostly mature professionals aged 25-65 (Yamashita et al., 2022), working in industries such as healthcare, engineering, and technology. Convenience sampling was used (Reis and Judd, 2000), and sample size was guided by

principles of saturation (Vasileiou et al., 2018). Delivery is hybrid, with some lectures taught face-to-face, and others online via Microsoft Teams. The BlackBoard© system is used to access learning materials, reading lists, and submit assessments amongst other activities.

A cohort of 15 participants who began their studies in October 2023, towards the CMDA with an embedded BA (Hons) Professional Management, were enrolled onto a hybrid taught, Level 4, 20 credit module which commenced on 7th February 2024 and concluded on 9th May 2024. The module's learning objectives focused on understanding the role of Human Resources (HR), including the processes and practices commonly undertaken by managers involved in the day-to-day operational management of people.

Demographic data such as age, gender, and race were not captured as they were deemed to have little relevance to the subject matter of the research. Therefore, findings cannot be considered in relation to representativeness (Dillman et al., 2014) and underrepresentation of subgroups (Gittelsohn and Steckler, 1994).

3.3. Time Horizon and Project Management

This research was cross-sectional. While the research timeline did impose limitations on scope and depth, such as the restricted ability of cross-sectional studies to establish causal relationships between variables (Babbie, 2016), the inability to observe changes over time (Creswell and Creswell, 2017), and potential selection bias (Bryman, 2016), these constraints were offset by significant benefits. The study provided a comprehensive snapshot and broad overview of the variables (Bryman, 2016), was quick and cost-effective (Babbie, 2016), and proved effective for gauging the prevalence of behaviours within the population (Creswell and Creswell, 2017).

Over a five-month period, the Lean project methodology was deployed to ensure timely completion (Bell and Morse, 2012). Avoiding project methodologies such as Waterfall (Royce,

1970) and Agile (Beck et al., 2001) which require one stage to be in action at a time, and for scope to remain fixed, the Critical Path Method was deployed, to allow for discussion board facilitation to take place simultaneously alongside other dependent tasks (Kelley and Walker, 1959). A Gantt chart and risk matrix can be found in Appendices A and B, respectively.

3.4. Discussion Board Activity

Over the first four weeks of the module, the BlackBoard© discussion board was integrated as a central interactive tool, chosen for its functionality and familiarity to the participants. Initially, in the first session, participants received targeted training on how to effectively utilise this platform. This initial training was crucial to ensure that all participants were equally prepared to engage with the technological aspects of the course and could focus on content rather than navigation challenges.

Following this introduction, the discussion board was employed strategically in two ways to maximise interaction and learning outcomes. First, during lectures, participants were grouped into breakout teams to engage deeply with specific questions, case studies, or scenarios directly tied to the weekly topic. This approach was designed to promote active learning and critical thinking, essential skills in human resource management, by encouraging participants to analyse and discuss complex real-world scenarios in a collaborative environment. Additionally, a related research task was assigned each week as a takeaway activity, encouraging participants to further explore the weekly topic and share their findings.

This second use of the discussion board aimed to extend learning beyond the classroom, fostering independent research skills and continuous engagement with the module content throughout the week. Participants were encouraged to actively respond to at least two peer posts, a strategy intended to cultivate a culture of critical engagement and peer learning.

The discussion topics included workforce planning, talent acquisition, selection processes, induction and onboarding, and motivation strategies; aligning with the overall aim of the module: to prepare apprentices for managerial roles that demand both strategic thinking and practical HR skills (Alghamdi, 2013).

3.5. Focus Groups

Following four weeks of study incorporating in-class and takeaway discussion board activities, the 15 participants were split randomly into two subgroups. Each subgroup was invited to take part in a one-hour focus group. The first focus group yielded six attendees, whilst the second yielded five. Therefore, an attendance rate of approximately 73% (11/15) was achieved.

The focus groups took place on 13th March 2024, group one between 14:00 – 15:00, and group two between 15:00 – 16:00. The venue used was a private lecture room. There were no interruptions throughout, and both sessions were recorded and transcribed.

The focus groups were semi-structured, with the aim to find out about the WBLs' general experience of discussion board activity, how it did (or did not) contribute to knowledge sharing and community building, what opportunities they perceive arise from this, and their subsequent recommendations. After an introduction to achieve closeness, rapport, and trust, and to create a conducive environment for open and honest responses in the respondent's own words (Seidman, 2013; Gubrium et al., 2002), the questions conveyed were:

- Please tell me about your experience of using the BlackBoard discussion board feature before this module.
- Please tell me about your experience of using the BlackBoard discussion board during this module.

- Can you provide examples of instances where the discussion board has positively or negatively affected your knowledge acquisition during this module?
- How do you perceive the influence of the discussion board on the exchange of information and expertise amongst the group?
- How do you perceive the influence of the discussion board in terms of you experiencing a sense of community amongst the group?
- Have you observed any interactions within the group that enhanced or limited the feeling of belonging to the CMDA community?
- How do discussion boards provide opportunities for learning and collaboration within the CMDA educational context?
- Are there any specific aspects of CMDA which you believe can be enhanced through the effective use of discussion boards?
- How would you suggest enhancing participation and interaction amongst CMDA apprentices on discussion boards?
- Are there any features, functionalities, or strategies you think could be added or modified to enhance the overall experience of discussion boards for CMDA apprentices?
- The researcher remained aware of power dynamics and differentials (Brinkmann, 2014), biases or preconceptions (Kvale and Brinkmann, 2009), socially desirable responses (Tourangeau and Yan, 2007), and presence and behaviour (Smith, 1995) throughout.

4. Findings and Analysis

4.1. Reflexive Thematic Analysis (ChatGPT 3.5)

ChatGPT 3.5 was used to perform Reflexive Thematic Analysis (Braun and Clarke, 2022), as per Figure 5.

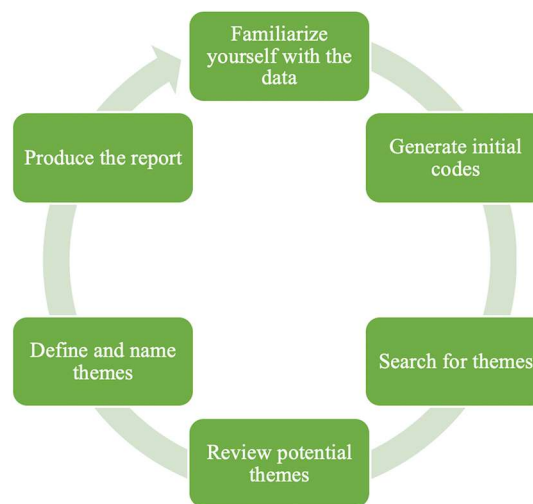


Figure 5. Reflexive Thematic Analysis, adapted from Braun and Clarke (2022).

Zhang et al. (2023) demonstrate the effectiveness of ChatGPT in the thematic analysis process. They describe how the use of cueing frameworks bolster ChatGPT's contribution, thus amplifying the quality of thematic analysis. Similarly, Mesec (2023) tested the suitability of ChatGPT for qualitative analysis by feeding an interview response into the system and asking questions about basic themes and concepts. They find ChatGPT to be a useful tool, but the output must be supplemented by the human eye before generating the final report.

There are, however, limitations to the use of ChatGPT as a qualitative analysis tool. Hamilton et al. (2023) notes its inability to understand the world in a humanistic way, and its lack of knowledge of specific domains. They explain the limitation of the researcher to provide algorithms and programming which result in accurate analysis. They also note the limitation of memory - ChatGPT can only retain a certain amount of information at any one time. Meanwhile, in a study by Morgan (2023), ChatGPT performed "reasonably well" in qualitative

analysis, although they note it was less successful at identifying more subtle themes. Hence, a need to compliment with manual thematic analysis processes.

A potential limitation of this project was the use of version 3.5 of ChatGPT. The experiences of Zhang et al. (2023), Mesece (2023), Hamilton et al. (2023), and Morgan (2023) do not appear to be specific about which version of ChatGPT was used. In this case, 3.5 was used due to budget constraints.

4.2. Generation of Initial Codes

The prompt “generate thematic coding of the following focus group transcription” was inputted into ChatGPT 3.5, as per Figure 6, for each group. The subsequent coding is displayed in Figure 7 and 8.

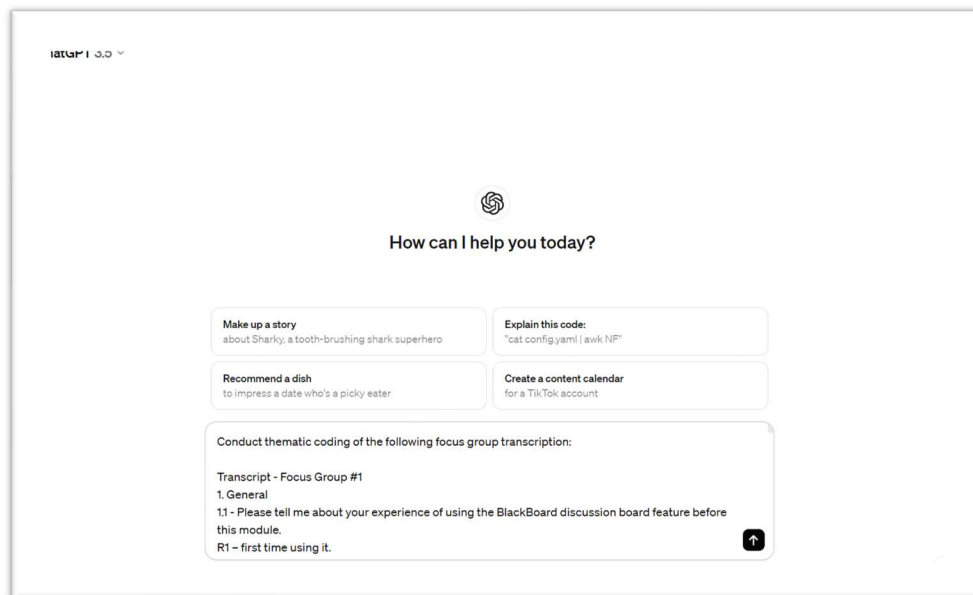


Figure 6. ChatGPT 3.5 prompt for thematic coding.

Code	R1	R2	R3	R4	R5	R6
Experience with BlackBoard discussion board						
Lack of prior use	X	X	X		X	X
Difficulty in accessing				X		
Lack of user-friendliness		X	X	X		
Potential for improvement with clearer guidance		X				
Importance of notifications	X					
Knowledge sharing						
Positive impact on critical analysis	X	X				
Lack of collaboration and engagement					X	X
Need for structured tasks to encourage participation			X			
Preference for alternative platforms like Teams				X		
Fostering community building						
Limited sense of community on the discussion board	X	X		X		
Preference for more personal communication channels like WhatsApp			X		X	X
Concerns about feeling behind or pressured	X			X		
Opportunities						
Potential for learning and collaboration	X		X	X		
Challenges with referencing			X	X	X	
Suggestions for alternative methods like book clubs	X		X			X
Recommendations						
Need for clearer alignment with course outcomes	X					
Mixed opinions on the necessity of enhancement		X				
Importance of lecturer engagement				X		
Suggestions for notification mechanisms					X	
Desire for better guidance and training					X	
Features and functionality						
Desire for platform flexibility and accessibility			X			
Suggestions for alternative platforms		X				
Concerns about duplication of content						X

Figure 7. Focus group 1 thematic coding.

Code	R1	R2	R3	R4	R5
Experience with BlackBoard discussion board					
Limited or no prior use	X	X	X	X	X
Varied usage during the module	X	X		X	X
Comparison with other platforms				X	X
Knowledge sharing					
Positive impact on assignment preparation		X		X	X
Limited engagement and comments			X		
Utilisation for research and sharing				X	X
Fostering community building					
Preference for other channels for community building	X	X	X		
Concerns about plagiarism		X			
Accessibility issues				X	
Segregation of academic and personal spaces					X
Opportunities					
Potential for learning and collaboration		X		X	X
Importance of proper introduction and instruction		X			X
Recommendations					
Integration of discussion boards from the start		X			X
Utilisation for capturing lecture content			X		X
Features and functionality					
Use as a repository for lecture content		X	X	X	
Capture mechanism for breakout activities		X	X	X	

Figure 8. Focus group 2 thematic coding.

4.3. Search for Themes

Armed with the thematic coding results, ChatGPT 3.5 was then prompted with the command “identify themes common across both datasets” as per Figure 9. The subsequent themes are displayed in Figure 10.

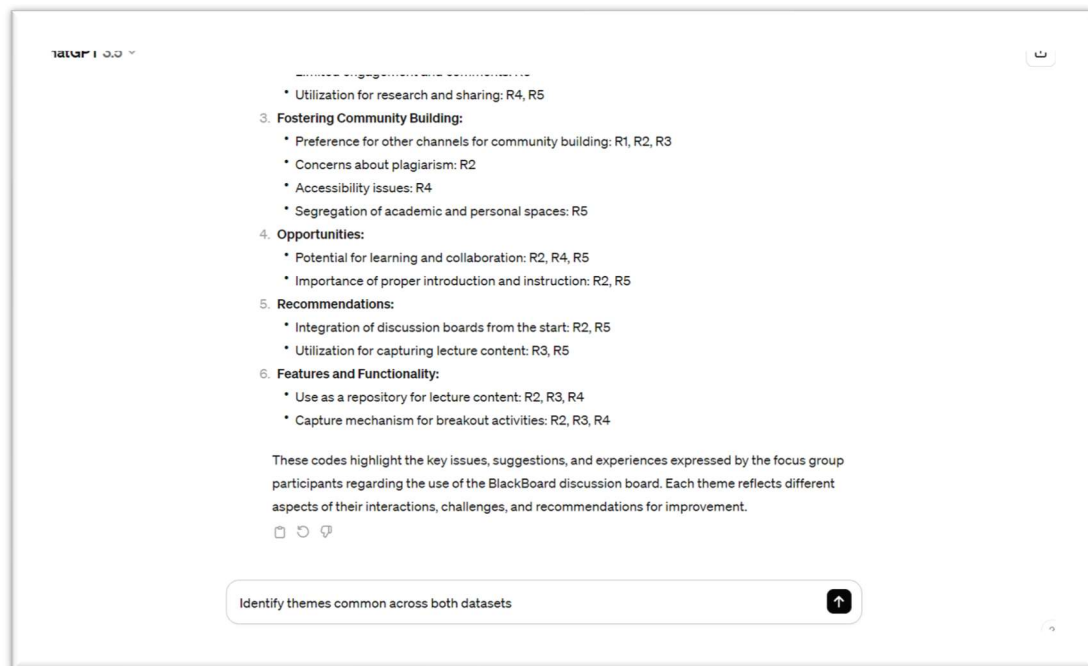


Figure 9. ChatGPT 3.5 prompt for identifying themes common across both datasets.

Experience with BlackBoard discussion board
• Limited or no prior use
• Varied usage during the module
• Comparison with other platforms
• Accessibility issues
Knowledge sharing
• Positive impact on assignment preparation
• Utilisation for research and sharing
• Limited engagement and comments
Fostering community building
• Preference for other channels for community building
• Concerns about accessibility and engagement
• Segregation of academic and personal spaces
Opportunities
• Potential for learning and collaboration
• Importance of proper introduction and instruction
Recommendations
• Integration of discussion boards from the start
• Utilisation for capturing lecture content
Features and functionality
• Use as a repository for lecture content
• Capture mechanism for breakout activities

Figure 10. Common themes across both datasets.

4.4. Review of Potential Themes

At this stage, noting aforementioned points surrounding a need to supplement AI with the human eye of a subject matter expert (Mesec 2023; Hamilton et al., 2023), ChatGPT 3.5's role in the process concluded, and thematic analysis of the identified themes in relation to the prior literature review commenced. A brief summary of the mapping of emerging themes to literature review themes is displayed in Figure 11.

Group Dynamics	Engagement and Interactions	Design and Facilitation	Motivation	Criticisms and Barriers
<ul style="list-style-type: none"> Varied usage during the module 	<ul style="list-style-type: none"> Limited engagement and comments 	<ul style="list-style-type: none"> Limited or no prior use Integration of discussion boards from the start Utilisation for capturing lecture content Use as a repository for lecture content Capture mechanism for breakout activities. Comparison with other platforms Accessibility issues 	<ul style="list-style-type: none"> Importance of proper instruction and introduction Potential for learning and collaboration Positive impact on assignment preparation Utilisation for research and sharing 	<ul style="list-style-type: none"> Preference for other channels for community building Concerns about accessibility and engagement Segregation of academic and personal spaces

Figure 11. Mapping of emerging themes to literature review themes.

4.4.1. Literature Review Theme 1: Group Dynamics

Despite the limitations mentioned, employing the BlackBoard© discussion board for a single group of all 15 participants brought several positive aspects to the project. The unified group setting facilitated comprehensive interaction among all members, allowing for a more integrated and cohesive discussion environment. This approach ensured that every participant had the opportunity to engage with all others, potentially leading to a richer exchange of ideas and a broader perspective on the weekly topics.

Furthermore, having the whole group together, rather than splitting into smaller subgroups, reduced the fragmentation of discussions and ensured that valuable insights were shared universally, promoting a comprehensive understanding across the cohort. This setup, while larger than the ideal 'magical number seven' (Miller, 1956), allowed for diverse opinions and interactions.

The Identified themes of 'varied usage during the module' may indicate group size as an issue. However, the respondents were only in their second semester together. As new apprentices, member ability (Hackman, 2002) and group stage (Tuckman, 1977) may be

contributing factors to engagement. For example, the sample's agreeableness (polite nature) during the focus groups may indicate their storming phase has not yet occurred. This may indicate shyness on the discussion board. Furthermore, as the boards were not anonymised, this may have limited freedom to engage in rich discussion (Connell, 2023; Colton and Hatcher, 2004). Group size and familiarity were, therefore, identified as key aspects in fostering community building, addressing research objective two.

4.4.2. Literature Review Theme 2: Engagement and Interactions

Figure 12 identifies a snapshot of the discussion board engagement. In this example, it can be seen how the 'limited engagement and comments' theme correlated to a single 'starter' and their 'invitation,' and subsequent 'responders.' A lack of 'activators' and 'latecomers' explains the absence of probing questions, challenge of assumptions, and additional valuable perspectives (Dalelio, 2013).

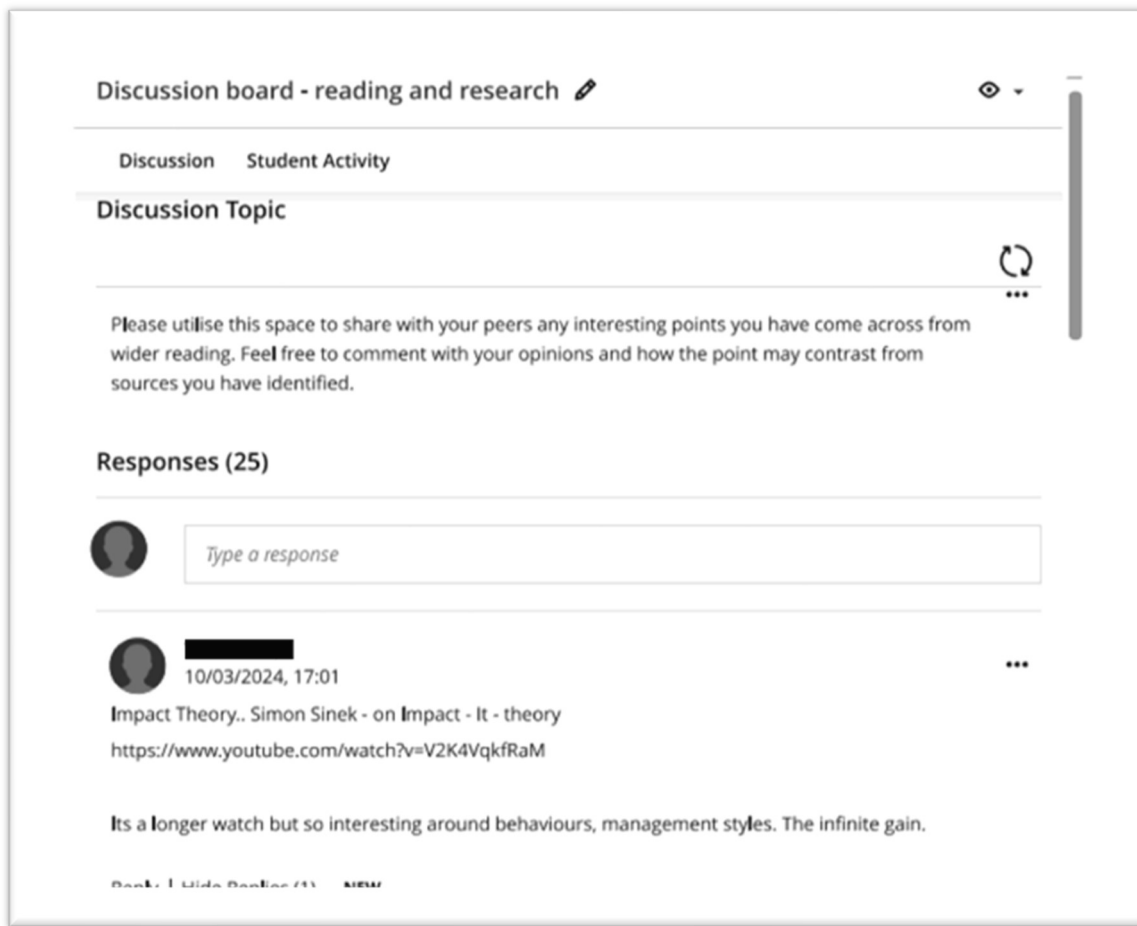


Figure 12. Discussion board engagement example.

This example highlights the discovery of a new relationship between two aforementioned theories; Four Fields (Champion and Gunnlaugson, 2018; Kantor, 2012; Scharmer 2009), and the holistic process of internet-mediated discussion (Covelli, 2017; Zhou, 2015). By analysing the example via the lens of the two theories (Figure 13), it can be seen how there is a lack of diversity in engagement across the Four Fields, with posts and responses limited to Field One ('talking nice,' 'follow'). The facilitator's choice to be a bystander is not noted in the identified themes but is picked up in transcripts "*Without lecturer prompt, the discussion board would go unused.*" The holistic process of internet-mediated discussion highlights the impact of the decision by the facilitator to be a bystander, effectively limiting subsequent lower- and higher-

level interactions. This concludes the importance of facilitator input in encouraging knowledge sharing, addressing research objective one.

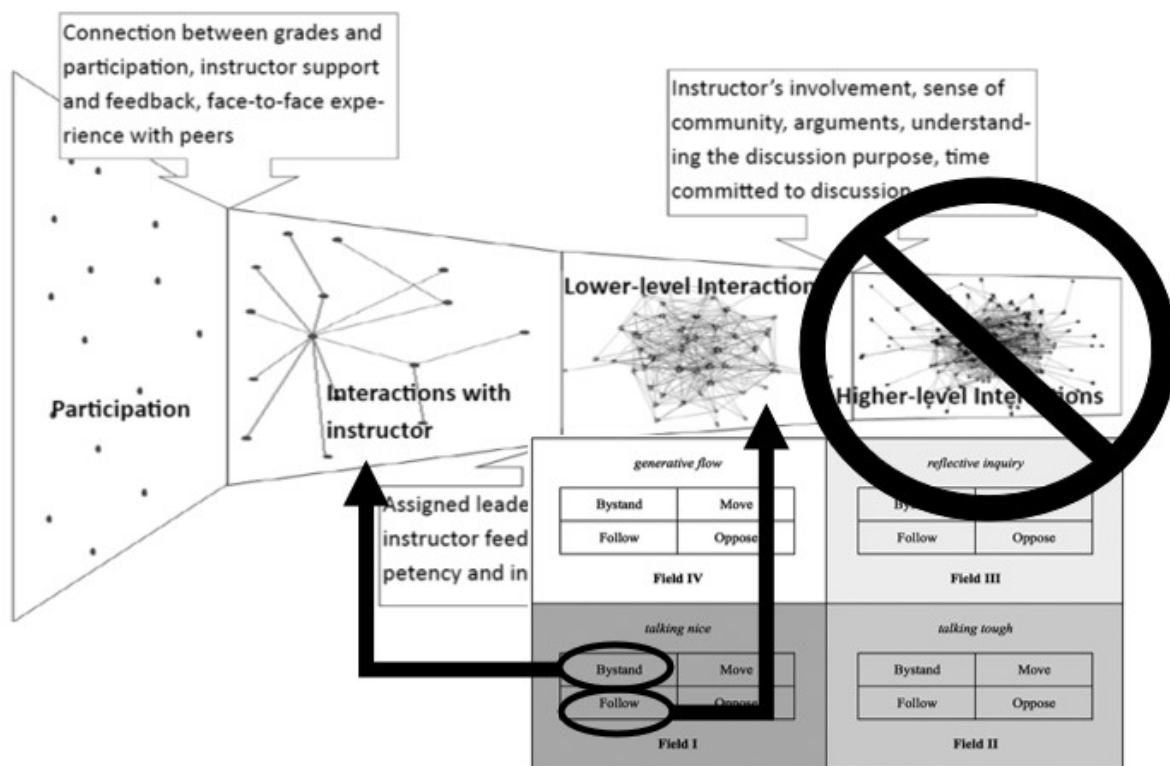


Figure 13. Annotated analysis of the holistic process of internet-mediated discussion (Covelli, 2017; Zhou, 2015), via the Four Fields (Champion and Gunnlaugson, 2018; Kantor, 2012; Scharmer 2009).

4.4.3. Literature Review Theme 3: Design and Facilitation

Themes of 'limited or no prior use' and 'integration of discussion boards from the start' is evident in comments such as "...discussion boards need to be implemented from day one." This reinforces Oppl and Stary's (2019) view of a need for a prepared environment and a clear link between curriculum design and discussion board structures. At present, although there is brief mention of discussion in Module Descriptors, there is a lack of inclusion of (or reference to) discussion boards in the wider CMDA curriculum at Staffordshire University. There is,

therefore, limited learning design to foster shared goals and community within the discussion board (Curaj et al., 2020).

The CMDA curriculum appears to embrace the Cognitive Apprenticeship Model due to its use of coaching, scaffolding, and reflection. However, comments such as *"I do not (sic) feel BlackBoard© is user friendly which may impact the discussion board"* and *"BlackBoard© training is not sufficient enough, we don't know how to navigate it..."* suggest shortcomings versus a key part of the model, effective online environment design.

This may influence the participant views (themes) of the discussion board feature being merely 'utilised (sic) for capturing lecture content' and a 'capture mechanism for breakout activities.' It may also point to the heavy 'comparison to other platforms' such as Microsoft Teams and WhatsApp, and related 'accessibility issues.' Collectively, this highlights opportunities to improve design, both curriculum-based and system-based, to better integrate discussion board activity, partially addressing research objective three.

4.4.4. Literature Review Theme 4: Motivation

The theme of 'importance of proper instruction and introduction' captures comments such as, *"maybe if we were sold the benefit of using the discussion board at the beginning, it would be better."* This emphasises the need for an early intervention aimed at informing WBLs about the usefulness of discussion boards, thus impacting intrinsic motivation to take part (Clinton and Kelly, 2020). A limitation of the findings and literature is the lack of acknowledgement of instruction and introduction for staff.

Whilst engagement was generally low and is noted as a limitation, identified themes of 'potential for learning and collaboration,' 'positive impact on assignment preparation,' and 'utilisation for research and sharing' indicate intrinsic motivation factors for 'passive watchers'

or ‘lurkers’ (Ransdell et al., 2018; Marett and Joshi, 2009). This contributes to research objective three by highlighting the importance of facilitator training.

4.4.5. Literature Review Theme 5: Criticisms and Barriers

Criticisms and barriers were sought by identifying duplicate themes, suggesting high prevalence. The theme of ‘preference for other channels for community building,’ such as the aforementioned Microsoft Teams and WhatsApp, support Morley and Jamil’s (2020) and Patel and Aghayere’s (2006) findings that few students utilise discussion forums despite their potential for facilitation peer interaction. This is noted as a duplicate theme of ‘comparison with other platforms.’

Furthermore, the theme of ‘concerns surrounding accessibility and engagement,’ identified as a recurring issue alongside ‘accessibility issues,’ highlights challenges such as low response rates, minimal dialogue, a predominant message-posting culture, and design limitations that hinder effective dialogue (Champion and Gunnlaugson, 2017; Dennen and Wieland, 2007; Webb et al., 2004; Thomas et al., 2002). Contrary to Ochoa et al.’s (2012) findings, which suggest a preference for social rather than purposeful use of discussion forums, this research demonstrates a shift towards using platforms such as WhatsApp for meaningful interactions, indicating a move away from less structured social exchanges on traditional forums.

4.5. Define and Name Themes

In summary, themes have been integrated into a conceptual framework (addressing research objective four) to improve the overall experience of discussion board engagement amongst WBLs, proposed in Figure 14.

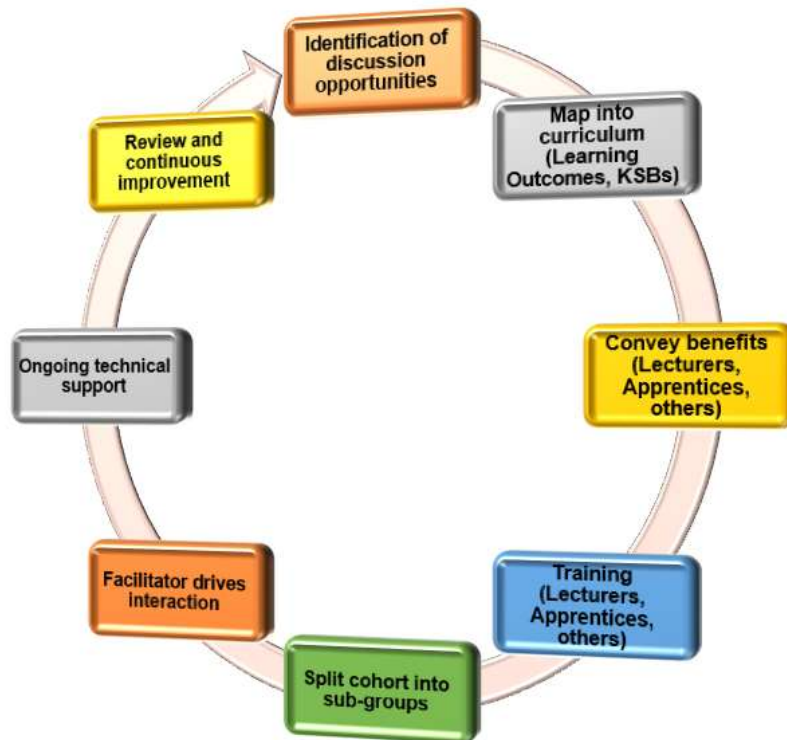


Figure 14. Proposed framework.

5. Conclusion

In conclusion, the investigation into the use of discussion boards within a WBL community has yielded insight into the benefits and limitations of this tool. Key themes of group dynamics, engagement and interactions, design and facilitation, motivation, and criticisms and barriers highlight a complex interplay between technology and pedagogy.

The study highlights that, while discussion boards have the potential to enhance knowledge sharing and community building amongst WBLs, several factors impact the significance of this, notably optimal group size, design and facilitation, and the ability of facilitators to motivate participants intrinsically and extrinsically. However, via a thoughtful and nuanced approach to integrating technology in educational settings, providers can better

leverage discussion boards to enrich the learning experience and academic success of its WBLs.

Critically, two contributions to theory are made. Firstly, reinforcement of the Cognitive Apprenticeship Model, which underscores the importance of contextual and social factors in learning environments. Secondly, the formation of the proposed framework; a step-by-step cycle of the creation and facilitation of discussion board activity in the WBL context. Small-scale trials, informed by Lewin's (1951) change management model, could provide a practical approach for testing and implementing these strategies effectively.

This study is constrained by a relatively small participant pool and a limited number of focus groups, a situation precipitated by the short timeline under which the research was conducted, although saturation was achieved. These constraints may impact the generalisability of the findings and the depth of the insights gathered. Looking ahead, it would be beneficial for future research to expand the scope of investigation to include a more substantial and diverse sample. This could involve multiple cohorts of WBLs across various institutions and provisions.

Expanding the research in this way would allow for a deductive study designed to rigorously test the hypothetical effectiveness of the proposed framework. By employing a deductive approach, future studies could systematically verify or refute the assumptions underpinning the framework, based on a broader set of data points. This expansion would not only enhance the strength and validity of the findings, but also refine the understanding of how the framework can be optimally implemented in diverse educational settings.

Additionally, by engaging with a variety of institutions, the research could capture a wider range of experiences and practices, thereby enriching the dataset and providing a more comprehensive view of the factors that influence effective discussion board engagement. This

approach would also help to identify any contextual or institutional variables that may affect the success of the proposed framework, enabling more tailored and effective recommendations for enhancing discussion board use in higher education contexts.

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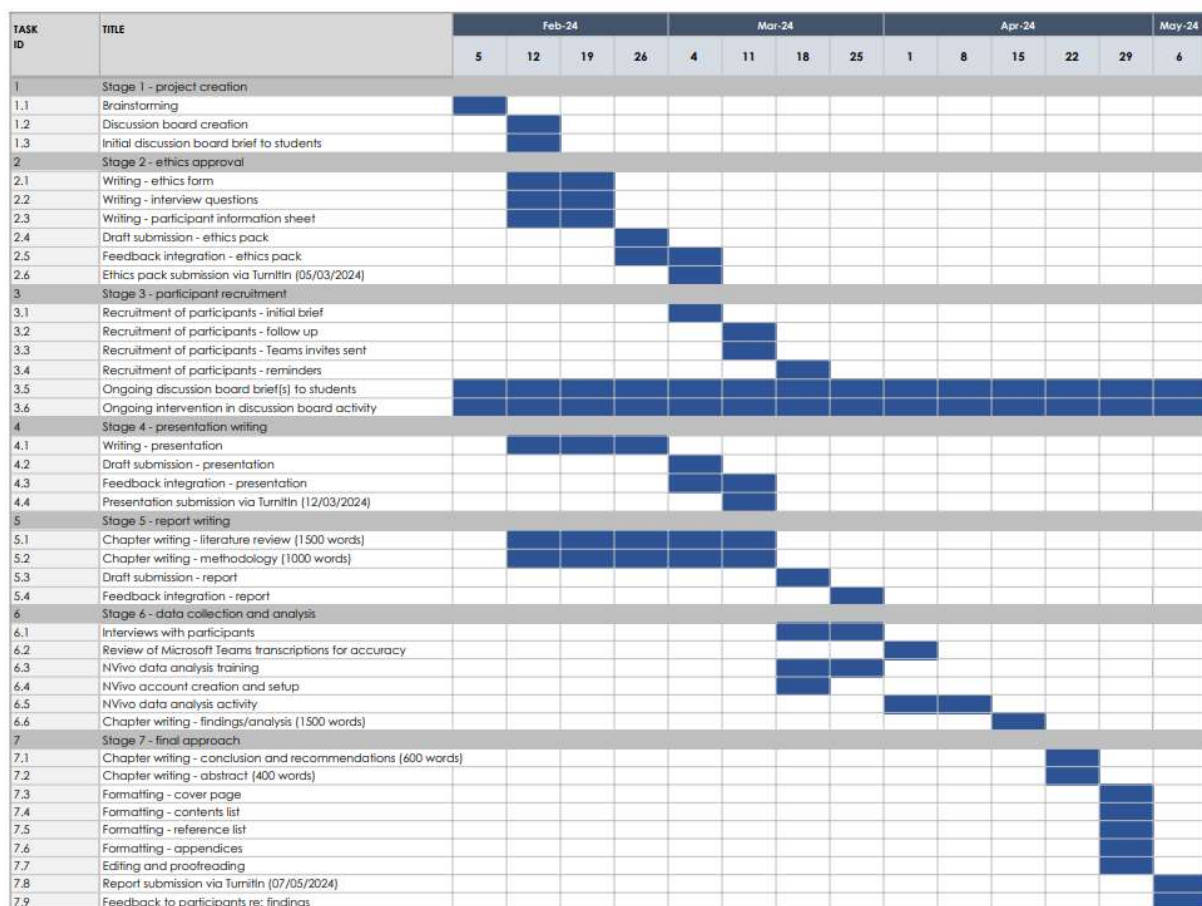
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Appendices

Appendix A. Gantt chart.



Appendix B. Risk matrix.

Very likely	Small sample size and non-random selection of participants (Silverman, 2013)	Power dynamics (Brinkmann, 2014)	Biases and preconceptions (Kvale and Brinkmann, 2009)
Likely	Interview cancellations	Presence and behaviour (Smith, 1995)	Socially desirable responses (Tourangeau and Yan, 2007)
Unlikely	Insufficient participants	Microsoft Teams technical issues	NVivo (data analysis tool) technical issues
Occurrence / Impact	Low	Moderate	High