



AI-Driven Collaboration Hubs for Optimizing Remote Teamwork in Higher Education: HBMSU as a Case Study

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ARTICLE INFO

Keywords:

Artificial Intelligence (AI), AI-Driven Collaboration, Remote Teamwork, Higher Education, Predictive Analytics, Digital Collaboration

Received: Feb, 11, 2026

Accepted: May, 09, 2026

Published: Jun, 25, 2026

ABSTRACT

This paper explores the effectiveness of AI-driven collaboration hubs in enhancing remote teamwork in higher education. A case study of Hamdan Bin Mohammed Smart University (HBMSU) is presented in this paper to investigate the identified gap. A conventional academic collaboration hub tool can provide features to some extent of communication and file-sharing, but still fail to support advance task management, coordination, and tailored learning-team connection. Introducing AI-driven tools and features such as automated scheduling, predictive analytics, effectiveness of virtual teamwork, adapted learning support, and knowledge sharing in remote settings will offer the possibility to enhance student and faculty collaboration. The research is prepared based on a qualitative cross-sectional survey and interview directed to the experts in the AI field across different programmers to capture observations of usability, automation, satisfaction, and engagement. The target of the survey and interview questionnaire is to assess the effect of AI-driven features on teamwork efficiency, communication quality, and platform adoption. In addition, to understand which exact AI features most contribute to improving remote teamworking efficiency among students and faculty. As a result of this research, it was observed that AI-driven collaboration significantly enhanced team efficiency, engagement, and overall satisfaction compared with conventional digital tools. Nevertheless, the challenge of integration issues and low awareness of advanced AI features emerged as the main barriers. The findings of research support both hypotheses of technology impact, which significantly improve the task efficiency and user engagement, and satisfaction.

1. INTRODUCTION

The increased use of the remote learning space has changed the landscape of higher education, which makes universities all over the world consider the AI-driven collaboration hub as the driver of productivity, collaboration, and interaction [1]-[4]. The pandemic increased the level of digital transformation, as institutions were compelled to rethink the limitations of teamwork that goes beyond the physical space. Collaborative learning platforms are now based on Artificial Intelligence (AI) which allows team members to maintain

successful collaboration remotely through smart scheduling, adaptive feedback, and intelligent resources management [5][6].

1.1. Research Problem

Many UAE universities, including HBMSU, introduced and utilized digital collaboration platform to sustenance and align with remote learning [7]. However, this platform is limited and has a lack of AI capabilities and adaptability for area of the predictive analytics, effectiveness of

virtual teamwork, adapted learning support, and knowledge sharing in remote settings [8]-[11].

Current digital collaboration solutions used in UAE universities, such as HBMSU, do not have enough AI to improve predictive analytics, collaboration efficacy, and remote learning adaptability. This is a drawback of the entire effectiveness, the quality of communication and interaction of the remote academic teamwork.

1.2. Research Purpose

To improve and evaluate AI-driven collaboration hub for remote academic teamwork. This will be achieved by conducting different level of research and benchmarking across international universities to come up with the best practice of AI features and deliver a strategic roadmap of enhancement [12][13].

1.3. Research Objectives

- To test how AI-based collaboration hubs used can contribute to the effectiveness, productivity, and the quality of communication during the work of a remote team at a higher educational establishment.
- To identify the features of AI (i.e., chatbots, smart scheduling, predictive analytics) that best enhance the efficiency of remote teamwork between students and faculty.

1.4. Research Questions

- How can AI-driven collaboration hubs enhance the effectiveness, productivity, and communication quality of remote teamwork in higher education institutions?
- Which AI features contribute most to improving remote teamwork efficiency among students and faculty?

1.5. Research Hypotheses

- **H1: (Technology Impact Hypothesis)**

Implementation of an AI-driven collaboration hub will significantly **improve** task efficiency in remote teamwork in higher education.

- **H2: (Engagement & Satisfaction Hypothesis)**

The perceived usability, AI-powered automation, and personalized recommendation features of the collaboration hub have a positive and significant effect on user engagement, platform adoption, and overall user satisfaction.

1.6. Significance and Scope of the Study

The study is part of the emergent research in the field of AI adoption in education since it provides a case-based analysis of the collaboration ecosystem at HBMSU [14]. It will present the evidence-based estimates of how AI tools can improve the results of remote teamwork, facilitate the process of communication, and facilitate innovation. The results are supposed to inform policymakers and educators to implement scalable AI solutions to enhance digital collaboration and academic performance in institutions of higher learning [3][15][16].

2. LITERATURE REVIEW

2.1. Theoretical Foundation

The research is based on the Technology Acceptance Model (TAM) put forward by Davis (1989) which is brought out as the mechanism by which the users accept and adopt technology [17]-[20]. The model assumes that two variables affect the attitudes of the users to engage in new systems, one of them is Perceived Usefulness (PU) and Perceived Ease of Use (PEOU) [21]-[25]. TAM can be used in the framework of the AI-based collaboration hubs in higher education to yield a streamlined organization of faculty and student perceptions and adoptions of the AI-based solutions, including chatbots, predictive analytics, and smart scheduling [26]. This research will employ the TAM approach to determine the level to which the perceptions of utility and the ease of AI can be utilized to determine engagement of the users, the level of satisfaction, and effectiveness of remote team working [4][27][28].

2.2. Review of Related Studies

- **History of AI in Remote Higher Education.**

This usage of AI in higher education has gained momentum after 2020, as online learning requires the scalability and personalized approach necessitated by the concept [29][30]. Intelligent tutoring systems and learning management systems (LMS) developed as AI-enhanced platforms have acquired functions of allowing the student/teacher interaction to become more meaningful, simplifying the administration process, and improving teamwork dynamics [5][31]. According to [32] the fact that AI-based optimization enhances connectivity, accessibility

and real-time feedback, which are paramount to the success of remote collaboration, is important.

- **AI-Powered Collaboration Hubs: Characteristics and Talents.**

The new collaboration platforms are based on AI-driven automation, chatbots, intelligent scheduling, and predictive analytics that can improve work teams and minimize inefficiencies.[33] notes that AI can process the routine coordination work, forecast the team deadlines, and suggest the most effective group compositions based on the information regarding behavior and performance of the participants [34]-[38]. Furthermore, the personalized recommendation systems are supported by the incentive of interaction by providing a context-based environment coupled with learning journeys created to meet the needs of every member [6][39][40].

- **AI to Improve Teamwork and Build Soft Skills.**

Working at the distance is not limited to the technological tools, and it requires cultivation of soft skills such as communication and creativity as well as problem-solving[41]-[45] state that AI in higher learning fosters the strengths of collaboration and critical thinking by simulating the group-based learning and adaptive dialogues [46]-[50]. Predictive analytics would allow implementing the changes in a group, which is not performing, and enhancing the interaction and unity of the underperforming team [51]-[53].

- **User Interaction and AI-Based solution Contentment.**

The adoption of AI-driven systems depends on perceived usability and satisfaction [54]. [8] shows that intelligent tutoring systems with reinforcement learning is better at engaging and satisfying the user as it dynamically adjusts to the needs of the learner [55][56]. Cognitive load can be lowered and perceived value improved in collaboration hubs with AI-assisted automation and custom dashboards [57].

- **Comparative Studies and Benchmarking.**

The analysis of AI adoption in international universities shows that the collaboration ecosystem with AI implemented in the educational institutions and the traditional e-learning model are known to be at a disadvantage when it comes to knowledge transfer, innovation rates, and

satisfaction in students [38]-[63]. [2] additional evidence supporting the fact that AI-based hubs can transform the academic process of working in a team by making predictions on the learning process and increasing the efficiency of the overall communication process [64][65].

2.3. Research Gap

Although the literature on the use of AI in higher education is increasing, a small number of studies are conducted on the implementation of AI-powered collaboration hubs specifically aimed at optimizing the work of remote teams and user interaction in the UAE setting. Although research emphasizes using AI in adaptive learning, predictive analytics, and virtual collaboration [66], little explores the integration of the approach in higher education centers such as HBMSU. In addition, the literature is mainly concerned with pedagogical or technological views as opposed to a strategic, data-driven model that matches the characteristics of AI with the performance of teams, their satisfaction, and sustainability [3][67].

2.4. Research Model

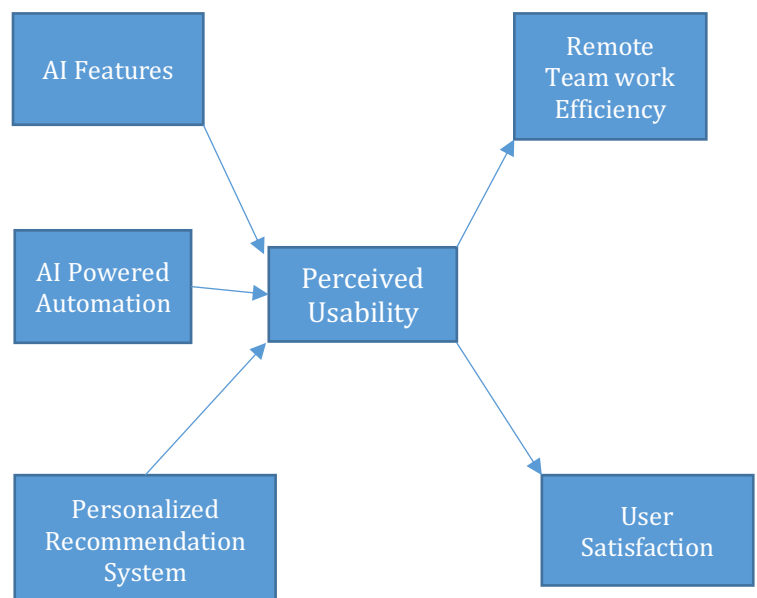


Figure 1: Research Model (Source: Author Developed)

3. RESEARCH METHODOLOGY

3.1 Research design

This proposed research is prepared based on a qualitative cross-sectional with a descriptive-comparative research methodology and the research design approach that helps this study to deeply analyze how the AI-driven collaboration hubs will recreate a crucial role in developing the teamwork quality in the higher education departments and what the impact of using this facility will be in the education sector.

The research uses a case study of Hamdan Bin Mohammed Smart University (HBMSU) to gather more reliable data for this context, and the data will be collected through a structured survey and short interviews as qualitative data.

3.2 Research Sampling

This research involved different participants as the target population to gather information; the selected sample consisted of 25 participants, mainly experts, administrators, and professors, who were asked a set of questions to understand their perspectives on digital tools. The main reason for choosing those participants is that most members use digital collaboration to improve their team management and achieve the desired outcome. To ensure the success of this research and to gather accurate information, this research uses the purposive sampling method to select participants with extensive experience and knowledge, who are well-informed about the topic and understand every aspect of digital tools in Education. By adopting this structure for the project, it was ensured that the information would be more accurate and authentic, thereby helping complete the project.

3.3 Data Collection Tools and Procedures

The collection of data was based on the method of online survey (see Appendix A), which consists of 10 close-ended questions that designed through SurveyMonkey and named (Global Benchmarking of AI-Enhanced collaboration Hubs in higher Education), The questions that was both categorical and liked-scale allowing the participants of the survey to answer each question as per their choice without being biased to any particular factors to ensure reliability.

This method also gave structure and flexibility to the survey, by which it was easy to ask the

participants about what are their experience with the digital tools, what challenges they face while using this facility, what role AI can play to improve their teamwork, which facts may affect the productivity in the works and how the communication can be impacted by it and the most important which concern they have in using the digital tools in their work.

3.4 Data Analysis techniques & Ethical consideration

SurveyMonkey infrastructure was used to prepare and administer a survey, collect responses, and evaluate the sample in this study. The platform's built-in tools are designed to produce descriptive statistics (percentages, means, and graphs), use filters to group comparisons, and create cross-tabulations to examine associations among variables. SurveyMonkey's text analysis tools analyzed the open-ended responses. All these methods facilitated quick and correct deciphering of the collected data. While surveying this project, participants provided consent and were informed about the information and the objective of the topic.

4. DATA ANALYSIS AND RESULTS

4.1 Survey Summary

AI-based collaboration hubs are changing the entire nature of remote teamwork in higher education by giving a channel for smooth communication, automated task management systems and insights based on data. The tools have shattered the geographical barriers aligning the information with each student. The AI-powered applications like Asana and Trello further help to automate the entire service system. Moreover, an interactive platform makes the learning experiences better by boosting engagement. The support given by the AI powered application allows for a sense of belonging. Through the survey, qualitative data has been collected which will provide information about the role of AI for collaboration among the team members in a remote setting. The survey results will help to put together themes of the different questions. A total of 25 respondents have been part of the survey.

- The 1st question asks about the professional role, to which 12% answered IT, 40% from faculty, 36% are AI experts, 8% are administrators and 4% are instructive designers.

- Question 2 asked about the total years of experience in higher education, to which 8% answered 3. 52% answered 4-7, 24% answered 8-12, and 16% answered 13+ years.
- The 3rd question asked about their country of practice to which 36% voted for UAE, 20% voted for Saudi Arabia, 28% voted for Qatar and 8% for Oman.
- On asking the next question “How much improvement do you expect in remote teamwork efficiency if HMBSU adopts an advanced AI-driven collaboration hub?” 28% said there will be no improvement, another 28% stated there will be slight improvement, 16% expects a moderate improvement, 16% expects high improvement and 12% are estimating there will be very high improvement.
- The next question asked “How much would an integrated AI collaboration hub reduce time wasting on switching between multiple platforms (email, WhatsApp, LMS, Google Docs)? More than 4% replied that there will be no reduction of time, almost 30% agreed with the option of small reduction, 30% voted for moderate reduction, 20% went with high reduction and almost 17% believed in very high reduction of time.
- The sixth question goes like “Which AI features do you believe should be implemented to achieve the highest efficiency in an AI-driven collaboration hub”? 4% voted for smart scheduling apps, 32% voted for Task automation, 28% voted for AI chatbot assistant, 32% went with AI-generated meeting summaries and 16% voted for Real-time collaboration analytics.
- On asking the next question about “To what question would the AI-driven collaboration help the teams to complete tasks in a remote environment?” 20% went with no improvement, 32% believed in minimal improvement, 32% believed in moderate improvement, 8% voted for strong improvement and 8% believed in exceptional improvement.
- Question 9 asked about the barriers that can reduce the AI-driven collaboration hub, 8% voted for the complex interference, 24% went with lack of training, 28% stated too many notifications, 24% voted for low trust in AI

features, 16% voted for the technical issues and slow performance.

- On asking the 10th question, “Which automation features would increase the user satisfaction?” Nearly 13% believed in Automatic reminders and follow-ups, 30% voted for AI-generated meeting summaries. 30% voted for the smart notifications, more than 37% voted for automated task assignments and 33% voted for the auto organization of files and messages.

4.2 Thematic analysis

From the available data set, three key themes have been developed. The analyses of each theme are presented in the following sections.

4.2.1 Enhancing team performance through the help of AI tools

Through the survey, it is visible that most of the respondents have agreed that utilizing some AI applications will increase the overall effectiveness of the entire team remotely. The tools will allow the students to pursue higher education by automating the tasks like scheduling and allowing them to close the gaps of language barriers and give an excellent project management tool that will scan the workloads and recommend the assignments. These platforms are of great use offering feedback and support in a digital environment [68]-[72].

The communication in the remote working environment is better with AI's transcription of real-time meetings, creating summaries and assuring that all the team members stay on the right track [73]. The tools can help in higher education assignments through grammar check and by providing clarity in the written work. Besides, the Artificial Intelligence tools can allow automation for repetitive tasks and make the students concentrate more on the innovative aspect [74]. The tools can analyze the assignments that focus on everyone's strengths, increasing the efficient team collaboration.

4.2.2 The ethical concerns regarding the use of AI-powered applications

Many respondents in the survey are unsure of how much to trust an Artificial Intelligence application. The regulatory framework of AI needs to be consolidated in the UAE so that the remote team workers can actually trust the tools [75]-[78]. The ethical issues are complicated and raise challenges and dilemmas. Some of the key challenges are data

breach, transparency and accountability, and mutualization of the tools [79]-[82]. The biasness of the application can result in discriminatory outcomes of the assignments. The confidential data of the students can be miss utilized or at certain times, the answers given by the AI can be very difficult to understand [83]-[88].

Since the AI is dealing with a large amount of data, certain ethical challenges will be in collecting, analyzing and protecting the data so that the data is kept safe. The AI algorithms are sometimes challenging to acknowledge and interpret because of the difficulty in understanding. Ensuring transparency and accountability is crucial for the students to trust Artificial Intelligence [89]-[93]. A good percentage of the respondents have stated that they won't be comfortable in trusting AI in their work.

4.2.3 Customizations will make the users satisfied

The AI tools can help with repetitive tasks or automatically scheduling some work. It can be very useful for the remote students since their learning path is now properly tailored, and the content can be overall customized to facilitate the students [94]. The key customization aspects will include adaptive learning paths, delivery of major content, and making some features accessible [95]. The AI platforms are very helpful to assess the overall performance and strengths of the students. It can make the content precise that will match the various content styles like the diagrams, bar graphs, charts etc [96]-[100]. The AI-powered chatbots and virtual assistants can give customized support for 24/7 to the students and answer their queries without the help of humans. The systems further give feedback on the assignments so that the students can rectify their mistakes. Customized AI tools give accessibility in many features that are not possible manually.

5. DISCUSSION

5.1 Interpretation of findings

The main objective of the research was to find out how the AI tools facilitate teamwork in a remote setting for higher education. Quantitative research was conducted using the survey and interview method. It can be interpreted that AI tools significantly help remote team workers in higher

education by facilitating their work with these tools. However, some ethical issues are associated with the use of AI in remote settings [101]. Although AI is becoming a constant source of assistance for students and teachers, it comes with a cost. Talking about the features, AI tools can help with customization and scheduling. The students can now focus more on the creative aspects instead of being concerned about the repetitive tasks [102].

On the other hand, it becomes difficult to align with the proper ethics of AI. In the past few years, Artificial Intelligence has been evolving at a quick pace, but it is becoming difficult for the policy makers to catch up to the frameworks [103]. For this reason, a lot of ethical concerns have been raised, like the data breach, transparency and accountability, and the misutilisation of the resources [104]-[110]. To combat this problem, a proper framework needs to be developed nationally and internationally that will stop the misutilisation of the data. The proper oversight of humans is the need of the hour, which will monitor the entire performance of the Artificial Intelligence applications. It can also be interpreted that the personalisation of the AI tools will help in enhancing the overall user experience [111]. Earlier, the work that used to take time and was monotonous can now be performed easily with just one click. At the same time, the algorithm bias from the previously entered information should be taken into consideration so that the results provided are not having any type of influenced.

5.2 Comparison with the prior studies

The previous studies about the topic have mainly shown a positive interaction of the algorithm with the students. It has provided a real-time analysis of the problem-solving skills of AI, at the same time highlighting the challenges that come with ethics and privacy [112]-[114]. The main areas of research have primarily focused on educators' support in AI, the process of personalized and adaptive learning, automating tasks, and AI acting as a form of engagement for students. For instance, we conducted a benchmark between universities that have already adopted AI tools, and we took HBMSU as a case from the UAE.

gaps suggest the need

Criteria Areas)	(5 ASU (Now Available: ASU Rolls Out New AI Tools, 2024)	University of Toronto (Using AI Tools for Learning at U of T - UofT Student Life, 2025)	NUS (Learning Analytics Dashboard, 2025)	Open University UK (The Open University, 2025)	HBMSU (Current)
1. AI Tools for Collaboration	Full AI suite: auto-summaries, predictive alerts, smart scheduling	AI-powered research assistant, generative AI support	AI tutor, real-time analytics, automated workload balancing	AI writing assistants, adaptive learning tools	Limited AI tools; mostly LMS-based functions
2. Automation Features	Automated task allocation, meeting summaries	Automated grading support, smart notifications	Auto-dashboards, task automation	Auto-organization of content & resources	Manual setup, no AI automation
3. Personalisation	Tailored dashboards, adaptive content	Personalized content pathways	Adaptive learning engine, customised alerts	Personalized modules for each learner	Not fully personalised; one structure for all
4. Usability & Interface	Intuitive, integrated ecosystem	Unified portal, simple UI	Very fast navigation, integrated chat	Highly organized, clean interface	Good LMS but not integrated; switching required
5. User Satisfaction & Engagement Tools	Engagement tracking, AI feedback	Feedback analytics, behaviour prediction	Response analysis, engagement indicators	24/7 AI chat & guidance	Feedback done manually; limited AI engagement

Table 1: Comparison with the prior studies

The benchmark shows that HBMSU's current AI capabilities are limited mainly to basic LMS functions, leaving significant gaps across all key areas [115]. In AI tools for collaboration, HBMSU lacks integrated AI for automation, smart scheduling, and analytics, which other leading universities already use. In automation, HBMSU still relies heavily on manual setup without AI-driven task allocation, course automation, or workflow triggers [116]-[120]. In personalisation, the university does not yet offer adaptive learning, custom dashboards, or personalised content pathways. For usability and interface, the existing system is fragmented across multiple tools—LMS, email, chat—reducing efficiency. Together, these

for a unified, AI-driven ecosystem that automates tasks, personalizes learning, and enhances engagement [121].

The most realistic features for HBMSU to adopt first are those that improve efficiency without requiring major system changes. AI assistants can be quickly added to support routine LMS tasks, while automated dashboards and early-warning alerts can be enabled through existing analytics plugins. AI meeting summaries and smart scheduling tools are easy to integrate with current communication platforms, and creating a unified interface to connect the LMS and communication tools can greatly improve usability with minimal effort [122]-[130].

5.3 Implications for theories and practice

The collaboration of AI with the students for the remote teamwork will develop the communication practices through personalised learning and project management using the Socio-Technical Systems (STS) theory and the Technology Acceptance Model (TAM) theory. The STS theory refers to the integration of Artificial Intelligence in a remote setting that makes organisational performance achievable through the social and technological systems. The AI tools are effective, relying on the ability of the social system. For this research, it will refer to the students adapting to the academics effectively. On the other hand, the TAM model elaborates the AI tools adoption methods by emphasizing their usefulness. In higher education, students adopting AI at a higher rate of almost 90% state the proper utilisation of the tools for academic purposes, which influences the integration in proper practice.

For practice, it is already a well-established fact that the AI tools smooth the entire process of teamwork by providing special features of AI tools and summarizing discussions. The language and geographical barriers among the team members are broken. Academically, AI provides personalised insight to the students as well as analytical feedback. However, it is significant to consider the practical notions for the data privacy, security, and bias of the algorithm. There should be a solid data protection policy with transparent usage of AI.

6. CONCLUSION AND RECOMMENDATIONS

6.1 Summary of the key results

The key result can be summarised as the enhancement of productivity, communication, and engagement in remote environments and overcoming the challenges that come with working virtually. The first conclusion is that the team performance is enhanced through the utilisation of the AI tools. Additionally, the customisation allows each member to use the AI according to their need. A 24/7 support system will solve the queries without any human intervention. The negative side here is the ethical concerns regarding data breach, accountability, and trust. With the development of a proper framework, this issue can be solved.

6.2 Theoretical and practical implications

The theoretical implication is based on the Socio-Technical Systems theory (STS) and the

Technology Acceptance Model (TAM). The first one focuses on the significance of merging AI into the social system of an organisation and making the interactions possible between technology and people (Lippert et al., 2021). On the other hand, the TAM theory examines how AI tools can help with virtual teamwork in academics. Along with the benefits of AI, the practical implementations assess the potential issues like data privacy and algorithm bias, and a proper need for the training of the faculty and the students in higher education.

6.3 Limitations

The key limitations include algorithm bias, lack of data privacy, less human interaction, and over-reliance on academic activities. The AI systems take knowledge from the existing data set that may contain biases, leading to unfair outcomes. Less human interaction in a virtual setting may produce robotic content devoid of human emotional development. The lack of data privacy makes it difficult for users to trust an AI application. This situation gets worse with the existing digital divide across several sections. Moreover, maintaining an AI system is very financially challenging, which cannot be afforded.

6.4 Future Research Directions

The future results that we are looking for are that the AI-powered systems are making an impact on the remote teamwork of students in higher education. The key themes developed focus on the enhancement of team workers using AI, the customisation of features, and the ethical considerations in the utilisation of AI. It gives a comprehensive overview of these factors. This paper will be useful for the higher officials in the education department who are responsible for the development of the syllabus and division of work among the students. In short, this literature suggests that by using Artificial Intelligence, higher education looks very encouraging, but this application will need a well-curated approach merging technology with education.

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