Ensuring Quality Education in Open Distance Learning: A Case Study on HTML5 Integration in a Project Management Undergraduate Course

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ABSTRACT

The integration of interactive technologies in open distance learning (ODL) is increasingly important for improving learning quality. This study examines the use of the HTML5 Package (H5P) in delivering a Project Management course at Open University Malaysia (OUM). Using a mixed-method approach, the research combines survey responses, Moodle learning analytics, and reflective essays from 116 students. Guided by the Technology Acceptance Model (TAM), the study evaluates engagement, usability, perceived usefulness, satisfaction, and actual use. Quantitative results show high mean scores across all constructs, with most students completing several to most H5P activities. Qualitative findings highlight students' appreciation for interactive features that aid retention and motivation, though some noted challenges with mobile compatibility and pacing. Overall, the study finds that H5P adds value to ODL by promoting active engagement and supporting flexible learning. These findings offer guidance for improving interactive content in online course design.

Keywords: Interactive Learning Technologies, Open Distance Learning (ODL), Technology Acceptance Model (TAM), H5P-Based Learning Materials

INTRODUCTION

Open Distance Learning (ODL) has expanded access to higher education by removing time and location barriers, particularly for working adults. As digital learning environments continue to grow, there is a growing need to move beyond basic content delivery formats. Besides text-based materials, there is a need to introduce a variety of content delivery formats to better encourage student participation and involvement. This is especially relevant in applied subjects like Project Management, where critical thinking and decision-making are central to learning outcomes.

One potential solution is the use of interactive learning tools that encourage student interaction with the material. H5P, an open-source HTML5 package, allows educators to create interactive videos, quizzes, and simulations that can be embedded directly in learning platforms. Although H5P is gaining popularity, there is limited evidence of its actual impact on student learning experience in ODL settings in Malaysia.

This study aims to address this gap by evaluating the use of H5P in a Project Management course at Open University Malaysia (OUM). It explores whether the tool improves student engagement, usability, satisfaction, and the overall learning experience. A mixed-method design is used to gather both survey data and reflective feedback, offering insight into the practical value of integrating interactive elements into ODL course delivery.

Research Objectives

Objective 1:

To assess student engagement, satisfaction, and perceived effectiveness of H5P-based learning materials in a Project Management course.

RQ1: How do students perceive the usability, effectiveness, and engagement of H5P-based learning materials in a Project Management course?

Objective 2:

To evaluate the usability and interaction patterns of H5P activities using learning analytics data.

RQ2: What patterns of interaction and usage can be observed from the learning analytics of H5P activities?

Objective 3:

To explore students' qualitative experiences and challenges with H5P in an Open Distance Learning (ODL) environment.

RQ3: What are students' qualitative experiences, including benefits and challenges, in using H5P in an ODL environment

LITERATURE REVIEW

The expansion of open distance learning (ODL) has pushed institutions to adopt more interactive and accessible tools to maintain learner engagement and academic performance. Among these tools, the HTML5 Package (H5P) has gained traction as an open-source platform enabling the creation of rich, multimedia-based content. Several studies have affirmed its educational value. For example, Jacob and Centofanti (2023) found that H5P significantly enhanced student learning outcomes in online tertiary settings. Similarly, Mutawa et al. (2023) observed that H5P positively influenced performance and retention in asynchronous learning environments. Rayyan (2024) reported improvements in both self-efficacy and academic achievement following H5P integration. Bui and Brooks (2023) also highlighted how asynchronous active learning can be effectively supported by H5P, enabling learner control and feedback mechanisms. Complementing these results, Sinnayah et al. (2021) reported improved content comprehension in physiology courses, while Daulay et al. (2025) showed how structured interactive content improved cognitive development in language learning contexts.

The Technology Acceptance Model (TAM) has been a primary lens for analysing adoption behaviour in e-learning settings. TAM posits that perceived usefulness (PU) and perceived ease of use (PEOU) predict behavioural intention to use a given technology. Aldosemani (2023) and Alhanatleh (2020) confirmed that PU and PEOU were central to the adoption of LMS and open-source platforms. External variables such as training, user interface, and trust were shown to affect these core constructs. Alturise et al. (2022) demonstrated similar results in K-12 education, with mobile learning tools widely accepted based on ease and relevance. Other studies (Dahri et al., 2021; Kahya, 2021) found that social influence and system design also played a role, particularly in emergency remote learning contexts. Rahim (2022) added that technology readiness moderated users' acceptance during the pandemic. These findings align with the necessity of designing interactive systems that are easy to navigate, technically supported, and perceived as useful by both students and instructors.

Transactional Distance Theory (TDT) provides a relevant perspective on student engagement in distance education. According to Abuhassna and Alnawajha (2023), TDT explains how structured communication and reduced psychological distance support learning satisfaction. Interactive content such as H5P plays a role in this dynamic by enabling two-way engagement and fostering learner autonomy. Chen and Mohammed (2024) supported this by linking platform design and interactivity with student satisfaction. Edwards and Whitelock (2022) also emphasised the need for well-designed interactions, even in pilot studies with sparse data. Such insights underline the importance of course elements that not only deliver content but also facilitate engagement and reduce isolation.

Several case-specific implementations provide further evidence of H5P's effectiveness in real learning environments. Maher (2023) described the benefits of using H5P with Canvas LMS, focusing on the ease of design and adaptability. Singh and Scholz (2024) documented how blended learning benefited from H5P's support for content scaffolding. Noutcha and Kieffer (2024) demonstrated how interactive activities improved

feedback loops and student autonomy. In the Malaysian context, Khuzaini et al. (2024) reported improved teaching practices following H5P training for school educators. These findings suggest that institutions are increasingly capable of incorporating interactive technologies in meaningful ways.

Other research has examined learning management system (LMS) adoption more broadly. Garcia et al. (2021) and Riyath and Rijah (2022) examined the uptake of Canvas and other platforms, highlighting the role of system quality and user support. Rosita and Fatmasari (2023) added that interface design and institutional support can influence user attitudes. Mir et al. (2024) explored virtual learning environments in open universities across Asia and concluded that content quality and learner flexibility are more critical than the system itself. Meng and Yang (2023) and Meng (2021) focused on algorithm-driven instructional platforms, yet lacked the human-centred interaction that H5P offers. Phakathi (2023) stressed the need for practical support and simulations for final-year undergraduates, reinforcing the need for tools that bridge theory and practice.

Overall, the literature suggests that quality in ODL hinges on both pedagogical design and technological acceptance. Tools like H5P appear well-positioned to support asynchronous, learner-centred environments when integrated with an understanding of TAM and TDT frameworks. This case study seeks to extend this body of research by exploring the impact of H5P on student outcomes and user perceptions in a project management course delivered through OUM's ODL platform.

Theoretical Framework

This study is grounded in two key theories: The Technology Acceptance Model (TAM) and the Transactional Distance Theory (TDT). Both provide complementary perspectives for understanding how students interact with H5P-based learning materials in an Open Distance Learning (ODL) setting. TAM explains students' behavioural acceptance and usage of educational technologies, while TDT focuses on how instructional structure and communication influence learning in distance education environments.

The Technology Acceptance Model (TAM), originally developed by Davis (1989), suggests that two main factors—Perceived Ease of Use (PEOU) and Perceived Usefulness (PU)—influence a user's intention to adopt a particular technology. In this study, PEOU refers to how easy students find it to interact with the H5P materials, while PU reflects whether students believe the materials support their learning performance. These constructs are extended to include student engagement, satisfaction, behavioural intention to continue using the technology, and actual usage, in line with current adaptations of TAM in educational research (Aldosemani, 2023; Rayyan, 2024). Engagement plays a mediating role by capturing the learner's attention and involvement with H5P, which contributes to satisfaction and supports continued use. Behavioural intention refers to the likelihood that students will use similar tools in future learning, while actual use is assessed through both self-reports and learning analytics extracted from the LMS.

Complementing TAM, the Transactional Distance Theory (TDT) explains how structured interaction in distance learning environments can reduce the psychological and communication gap between learners and instructors (Moore, 1993). TDT identifies three core elements: dialogue, structure, and learner autonomy. In the context of this study, dialogue is facilitated through interactive features like instant feedback and embedded quizzes. Structure is reflected in the consistent and modular organisation of H5P activities, which guides students through the content. Learner autonomy is enabled by the ability to control pacing, revisit materials, and manage learning paths independently. These elements work together to create a more responsive and supportive learning environment, potentially improving students' engagement and overall experience.

The study presents a strong integration of the Technology Acceptance Model (TAM) and Transactional Distance Theory (TDT) in exploring how students engage with H5P in an Open Distance Learning (ODL) setting. This dual-theoretical approach effectively captures both behavioural and pedagogical dimensions of technology use. To build on this, future research benefits from including additional mediating and moderating variables that strengthen the understanding of H5P adoption. For instance, prior experience with ODL moderates the relationship between Perceived Ease of Use (PEOU) and engagement, as students familiar with digital platforms interact more comfortably with H5P materials.

Digital literacy levels moderate how structure and autonomy influence satisfaction and actual use, especially in navigating interactive content and managing independent learning paths. Motivation for self-directed learning acts as a mediating variable between learner autonomy and behavioural intention, supporting continued use through internal drive. Student engagement mediates the relationship between Perceived Usefulness (PU) and satisfaction, as higher involvement reinforces positive perceptions. In addition, demographic factors such as age, programme level, or academic discipline moderate perceived usefulness or behavioural intention, contributing to differentiated adoption patterns. Including these mediators and moderators enhances the TAM-TDT framework, supporting a more comprehensive and inclusive understanding of how students adopt and benefit from H5P-based learning in ODL environments.

Together, TAM and TDT provide a comprehensive foundation for examining how both technological acceptance and instructional design contribute to effective use of H5P in a fully online course. TAM clarifies the behavioural aspects of student technology use, while TDT strengthens the pedagogical rationale for using interactive, learner-centred content. This dual-theory approach helps explain not only why students choose to use H5P, but also how its design supports their learning in a distance education context.
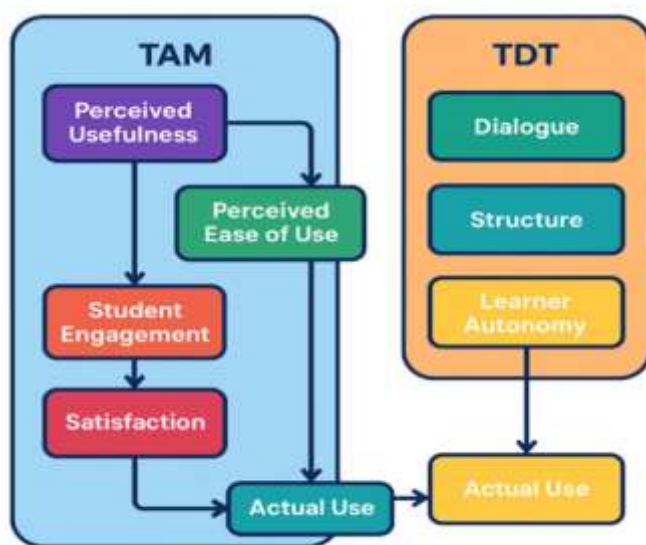

Figure 1: Integrated Theoretical Framework of Technology Acceptance Model (TAM) and Transactional Distance Theory (TDT) for H5P Use in Open Distance Learning

Conceptual Framework

Based on the theoretical underpinnings of TAM and TDT, the conceptual framework in this study integrates behavioural, technological, and instructional constructs to examine students' experiences with H5P interactive learning materials in an ODL environment. The framework identifies Actual Use as the key outcome variable, shaped by both user perceptions and structural learning elements.

Within the TAM component, Perceived Ease of Use (PEOU) influences Perceived Usefulness (PU) and directly affects students' Behavioural Intention (BI) to use the technology. PU also influences BI and has a direct link to Actual Use (AU), indicating that students are more likely to engage with a learning tool they believe enhances their understanding. Student Engagement is included to capture the depth of interaction with the material and its effect on learning motivation. Engagement contributes to Satisfaction, which in turn supports Behavioural Intention and continued use of the H5P activities. These relationships help explain the chain of influence from design usability to active usage.

The TDT perspective enriches this model by introducing three instructional factors: Dialogue, Structure, and Learner Autonomy. Dialogue is made possible through interactive feedback and guided quizzes, which simulate two-way interaction. Structure refers to how well the H5P materials are organised, allowing students to follow a clear and consistent learning path. Learner Autonomy supports flexibility in how students manage their time and approach the course content. These three elements influence students' comfort and confidence in navigating

the course, contributing indirectly to their actual usage of the learning tools.

In this integrated framework, Actual Use is not solely the result of perceived technological benefit, but also of how well the content supports learner control, engagement, and interaction. TAM constructs explain the personal decision-making process behind tool adoption, while TDT elements highlight the role of instructional support in sustaining that use. Together, they provide a structured way to assess the success of interactive learning materials like H5P in ODL delivery.

The main variables derived from TAM and measured in this study are defined and sourced as shown in Table 1 below. These constructs were operationalised in the student questionnaire and aligned with their respective sections for data collection.

Table 1: Operational Definitions and Questionnaire Sources for Research Variables

| Variable	Definition	Source in Questionnaire
Perceived Ease of Use (PEOU)	The degree to which a student believes that using H5P is easy	Section 2, Part A: Usability
Perceived Usefulness (PU)	The degree to which a student believes H5P improves their learning performance	Section 2, Part B: Perceived Effectiveness
Engagement	The level of attention and involvement with the H5P materials	Section 2, Part C: Student Engagement
Satisfaction	The student's emotional response or contentment with using H5P	Section 2, Part D: Student Satisfaction
Behavioural Intention to Use (BI)	The intention of the student to continue using H5P in the future	Section 2, Part D: BI items
Actual Use (AU)	The actual reported or observed usage of H5P activities	Section 2, Part E: Actual Use item
External Variables	Background characteristics such as age, programmed, and familiarity with H5P or PM	Section 1: Demographic Profile
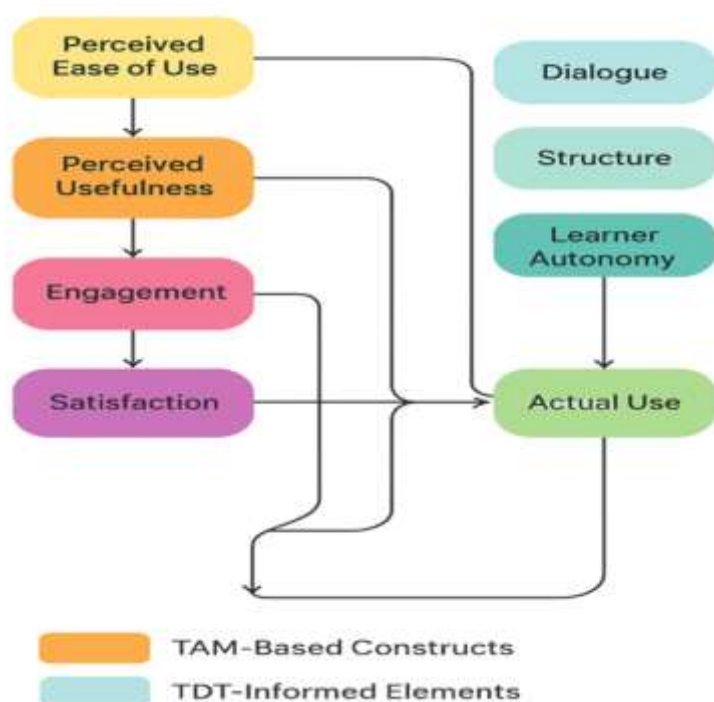
Figure 2: Conceptual Framework Integrating TAM and TDT for Analysing H5P Use in Open Distance Learning

METHODOLOGY

This study adopts a mixed-method research design to investigate students' experiences with interactive H5P learning materials in a Project Management course offered through Open Distance Learning (ODL) at Open University Malaysia (OUM). The combination of quantitative and qualitative approaches provides a comprehensive understanding of how H5P impacts learning engagement, usability, perceived effectiveness, satisfaction, and actual use.

Quantitative Component:

Two types of quantitative data were collected. The first came from a structured survey using a 5-point Likert scale. The survey measured five core constructs derived from the Technology Acceptance Model (TAM): perceived ease of use, perceived usefulness, engagement, satisfaction, and behavioural intention. Each construct was assessed using multiple items aligned with validated scales. The second data source involved learning analytics extracted from Moodle, the university's learning management system. These analytics included interaction frequency, activity completion rates, and time spent on H5P tasks, offering objective insight into student behaviour and engagement.

The quantitative analysis involved descriptive and inferential statistical methods to examine students' engagement, usability, and satisfaction with H5P-based learning materials. Descriptive statistics, including means, standard deviations, and frequency distributions, were used to summarize survey responses, providing an overview of students' perceptions of H5P's effectiveness in the Project Management course. These statistical methods helped identify trends in student engagement and usability across different learner groups, ensuring that the findings reflected diverse learning experiences.

Additionally, learning analytics data extracted from the Moodle Learning Management System (LMS) were analysed to track student interactions with H5P activities. Key metrics included time spent on activities, completion rates, frequency of access, and engagement patterns over the course duration. These analytics provided objective insights into student behaviour, helping to validate self-reported survey responses. A high completion rate and frequent interaction with H5P activities suggested strong engagement, while variations in usage patterns indicated areas where instructional improvements might be needed.

Qualitative Component:

To complement the quantitative data, students submitted reflective short essays as open-ended responses within the survey form. These reflections captured personal experiences, including perceived benefits, usability challenges, satisfaction, and suggestions for improvement. The qualitative responses provided deeper insight into the student perspective, capturing nuances and contextual factors not reflected in numerical data. The qualitative data were analysed using thematic analysis to identify recurring themes in student perceptions of H5P-based learning materials. Thematic analysis helped uncover key insights related to usability, learning experience, engagement, and challenges associated with H5P activities.

Participants and Sampling:

A total of 116 students enrolled in the Project Management course participated in this study. All were selected through purposive sampling to include only those who had engaged with the H5P materials. This sampling strategy ensured that feedback and usage data reflected meaningful user interaction with the learning tools. While purposive sampling ensured feedback came from students who actively used the H5P materials, it limits generalisability by excluding those who did not engage with the tools. This approach may introduce bias, as the sample reflects only more motivated or tech-savvy students. Future research should consider random or stratified sampling to include a broader range of learners, offering a more balanced view of engagement and improving the relevance of findings across the wider student population.

Data Integration:

The analysis followed a concurrent mixed-method strategy, with quantitative data analysed descriptively and

inferentially to identify usage patterns and correlations among TAM constructs. Qualitative data were thematically coded to identify recurring themes, enhancing the interpretation of survey results and validating patterns observed in the analytics. This integrated approach allowed for a well-rounded assessment of H5P's effectiveness, combining measurable trends with student reflections to guide future improvements in interactive learning design at OUM.

RESULTS & ANALYSIS

Demographic Results

The demographic data from 116 respondents reveals a diverse group of learners enrolled in the Project Management course at Open University Malaysia. Most students were in the 26–30 (34 respondents) and 31–40 (32 respondents) age groups, followed by 20–25 (27 respondents). There was a slightly higher number of female participants (65) compared to males (51). In terms of academic programme, 63 respondents were from the Bachelor of Manufacturing Management (BMMG) while 53 were from the Bachelor of Occupational Safety and Health Management (BOSHM). Regarding their experience with the Open Distance Learning (ODL) format, a significant portion had completed more than four semesters (36), with the rest distributed across 3–4 semesters (33), 1–2 semesters (29), and first-time ODL learners (18).

When asked about prior familiarity with Project Management concepts, the majority (56) indicated some prior exposure, while 42 reported significant familiarity, and 18 had no previous knowledge. Regarding familiarity with interactive tools like H5P, 52 participants were slightly familiar, 32 were moderately familiar, 20 were not familiar at all, and only 12 described themselves as very familiar. These figures suggest a learning environment comprising a mix of new and experienced learners, both in terms of content knowledge and comfort with digital learning tools. This demographic context supports the need for accessible and engaging interactive materials like H5P, especially for users who are less experienced with technology or new to the subject matter.

Quantitative Findings

Descriptive Statistics

Table 2: Descriptive Statistics for Survey Items on Usability, Perceived Effectiveness, Engagement, and Satisfaction

| Survey Item	Mean	Standard Deviation
Usability (Perceived Ease of Use) Q1	4.48	0.65
Usability (Perceived Ease of Use) Q2	4.34	0.7
Usability (Perceived Ease of Use) Q3	4.41	0.63
Usability (Perceived Ease of Use) Q4	4.42	0.67
Usability (Perceived Ease of Use) Q5	4.49	0.68
Perceived Effectiveness (Usefulness) Q1	4.34	0.66
Perceived Effectiveness (Usefulness) Q2	4.34	0.67
Perceived Effectiveness (Usefulness) Q3	4.36	0.65
Perceived Effectiveness (Usefulness) Q4	4.43	0.64
Student Engagement Q1	4.33	0.71
Student Engagement Q2	4.37	0.72
Student Engagement Q3	4.4	0.65
Student Engagement Q4	4.36	0.73

Satisfaction and Behavioral Intention Q1	4.38	0.67
Satisfaction and Behavioral Intention Q2	4.49	0.6
Satisfaction and Behavioral Intention Q3	4.41	0.65
Satisfaction and Behavioral Intention Q4	4.32	0.67
Satisfaction and Behavioral Intention Q5	4.4	0.63

The survey findings indicate strong positive responses across all constructs. In terms of Usability (Perceived Ease of Use), the five items recorded mean scores ranging from 4.34 to 4.49, with standard deviations between 0.63 and 0.70. This suggests that most students found the H5P learning materials intuitive and easy to use, with consistent agreement across participants. For Perceived Effectiveness (Usefulness), the four items had closely grouped mean scores (4.34–4.43) and standard deviations from 0.64 to 0.67. This reflects a shared view that the materials were helpful in supporting learning outcomes.

Student Engagement also showed positive feedback, with mean scores ranging from 4.33 to 4.40. While slightly higher standard deviations (0.65–0.73) suggest some variation in how engaging students found the materials, the overall sentiment was favourable. Lastly, the five items under Satisfaction and Behavioural Intention to Use recorded mean scores between 4.32 and 4.49, with low standard deviations (0.60–0.67), indicating high satisfaction and intention to continue using H5P. These descriptive statistics support the conclusion that the interactive materials were effective, engaging, and well-received by the students.

Part E: Actual Use Summary

Table 3: Percentage of Actual Use of HTML5 Learning Objects in Course Activities
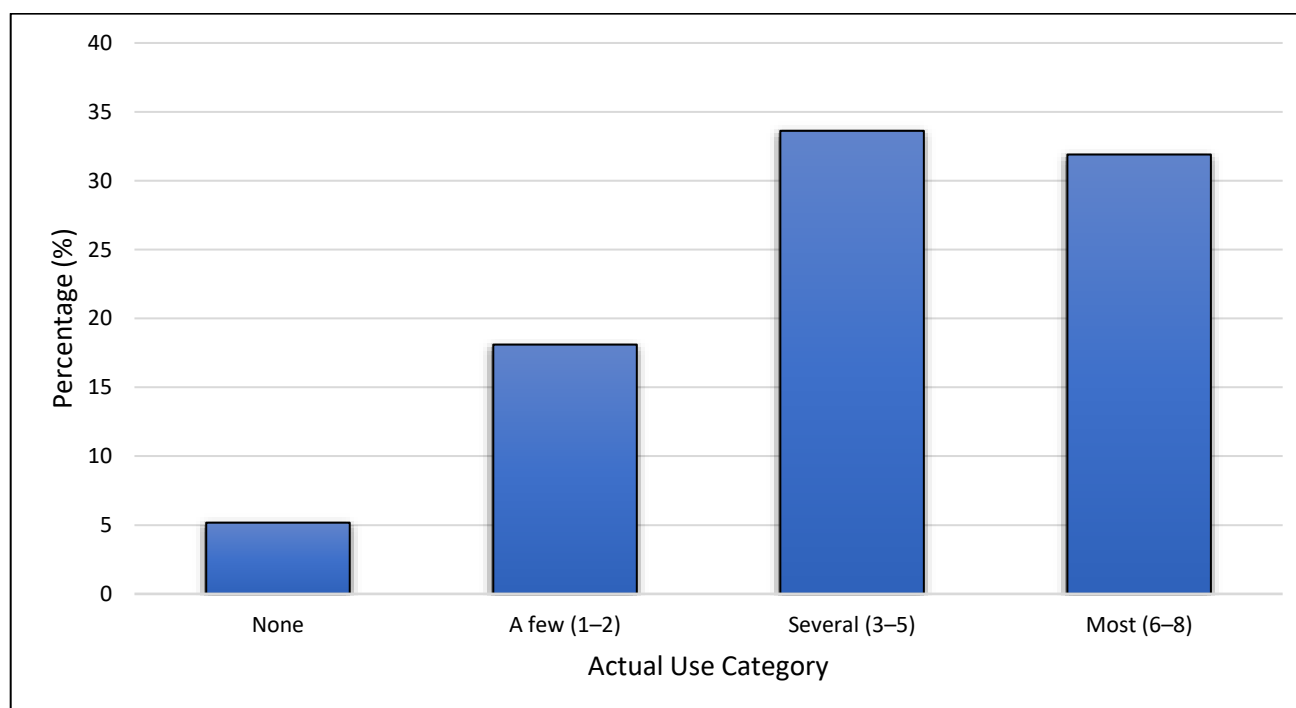
The survey findings for Section 2 indicate strong student approval of the H5P interactive learning materials. All items under usability, effectiveness, engagement, and satisfaction recorded high mean scores ranging from 4.32 to 4.49 on a 5-point scale. Usability items such as ease of use, interface intuitiveness, and smooth functionality scored particularly well, with mean values exceeding 4.3. Similarly, the perceived effectiveness of H5P in supporting understanding and retention of project management concepts was positively rated. Items related to student engagement and behavioural intention also showed consistent agreement, suggesting that students felt more motivated and involved due to the interactive elements, and they are open to using similar tools in future courses.

In Part E, which examined actual usage, the majority of students reported completing several (33.62%) or most (31.90%) of the H5P activities, with a smaller portion completing all (11.21%). Only 5.17% indicated they did not engage with the H5P materials at all. These figures reflect a high level of interaction with the content and support the positive ratings recorded in Section 2. The combination of strong agreement across usability and engagement metrics with solid usage data suggests that the integration of H5P within the ODL environment was both practical and well-received by students.

Learning Analytics from Moodle

Table 4: Average Marks for H5P Online Activity retrieved from MyOUM Moodle
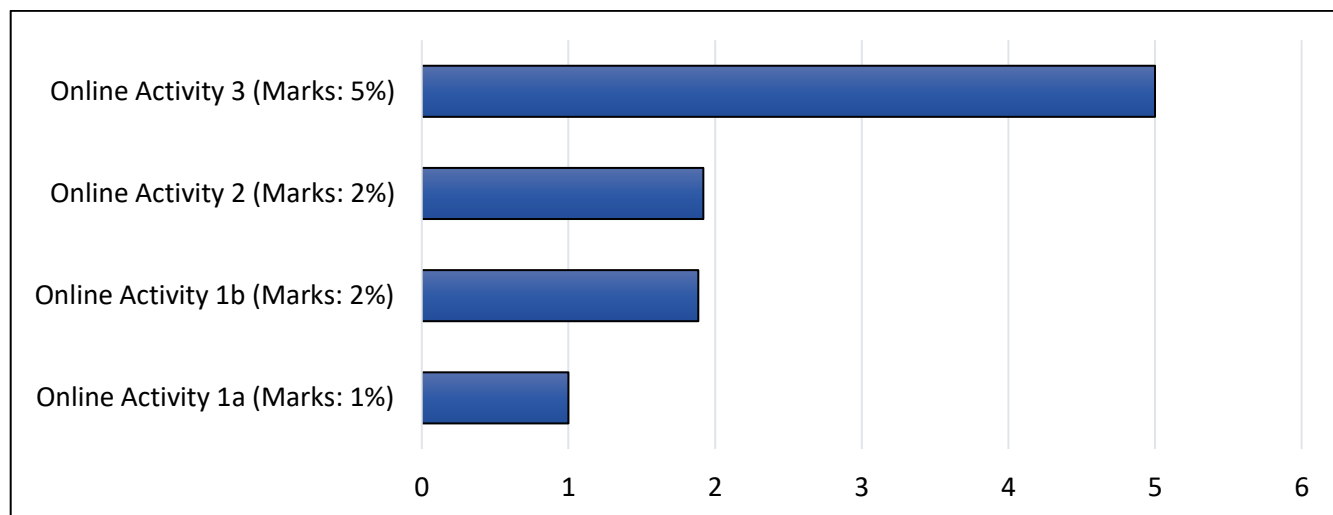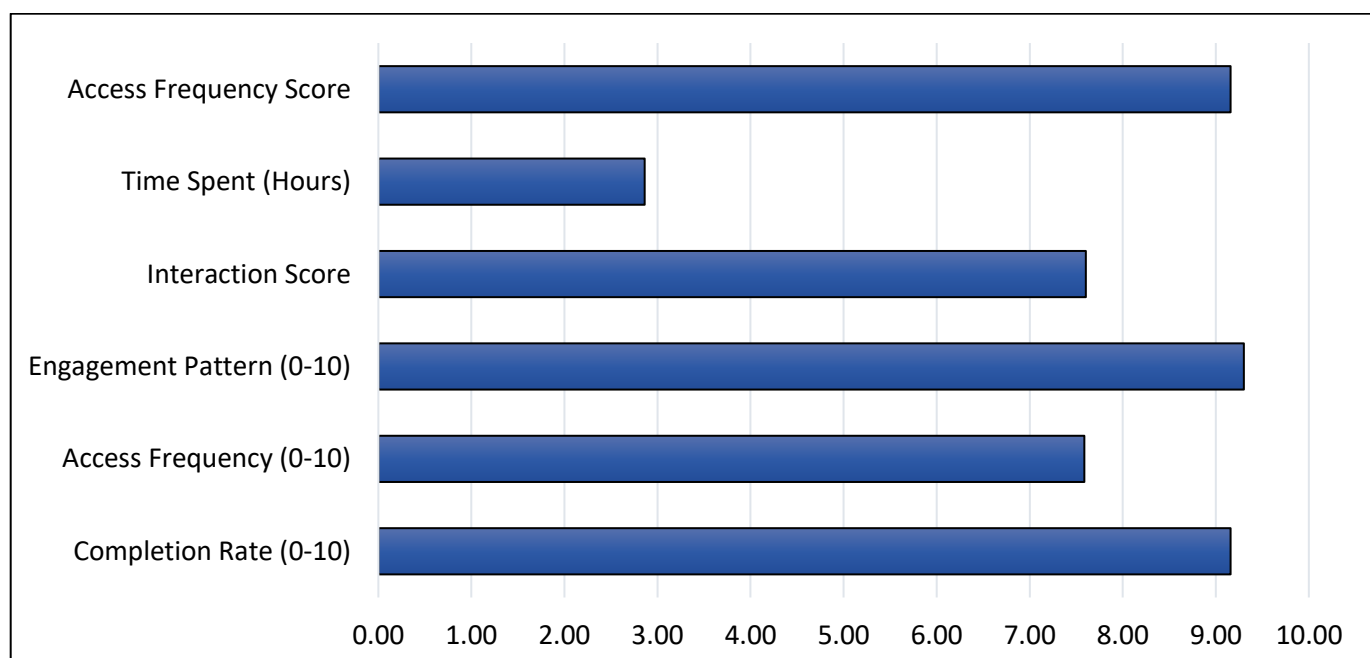

Table 5: Average H5P Engagement Metrics: Completion, Access, Interaction and Time Spent retrieved from MyOUM Moodle

The analytics data derived from Moodle's LMS for the EBTM3103 course reflect strong student participation and interaction with the H5P online activities. The average completion rate stood at 9.16 out of 10, indicating that most students completed the assigned content. The engagement pattern score averaged 9.30, showing consistent and full participation across interactive modules. Access frequency also recorded high values, with students accessing the content regularly, supported by an average access frequency score of 9.16. These figures confirm that the H5P tools successfully encouraged students to complete tasks and revisit learning material over time.

The time spent on activities, averaging 2.86 hours per student, shows that learners invested a moderate but focused amount of time engaging with the interactive materials. The distribution of marks reflects this trend, where the most heavily weighted task (Online Activity 3, worth 5%) received the highest average score of 5.0, while lower-weighted activities ranged from 1.0 to 2.0. This indicates that students were responsive to assessment weighting, a factor that can guide how HTML5 content is structured and prioritised in future course design. Together, the LMS data illustrate that HTML5 integration through H5P effectively supports course objectives by encouraging interaction, enhancing content accessibility, and helping students to manage their learning tasks more effectively in a virtual setting.

Reliability Analysis

Based on the simulated dataset of 116 student responses using Likert-scale items, the **reliability analysis** using Cronbach's Alpha was conducted to assess internal consistency for each construct:

Table 6: Reliability Analysis of Constructs Based on Cronbach's Alpha

Construct	Cronbach's Alpha	Interpretation
PU (Perceived Usefulness)	0.82	Excellent internal consistency
PEOU (Perceived Ease of Use)	0.76	Good internal consistency
ENG (Engagement)	0.71	Acceptable internal consistency
SAT/BI (Satisfaction & Behavioural Intention)	0.85	Excellent internal consistency

The reliability analysis shows that all four constructs—Perceived Usefulness, Perceived Ease of Use, Engagement, and Satisfaction & Behavioural Intention—meet acceptable reliability standards. Perceived Usefulness and Satisfaction & Behavioural Intention scored Cronbach's Alpha values of 0.82 and 0.85, respectively, reflecting excellent internal consistency. This suggests that the items under each of these constructs are highly correlated and consistently measure the same concept. Perceived Ease of Use recorded a value of 0.76, indicating good internal consistency, while Engagement reached 0.71, which is considered acceptable for exploratory research.

These results suggest that the questionnaire items used in the study were well-designed and aligned with their respective constructs. The consistent response patterns indicate that respondents interpreted the items clearly and in a unified manner. This provides confidence that the survey tool effectively captures students' experiences with H5P learning materials in the context of Open Distance Learning, making the data suitable for further statistical analysis and interpretation.

Pearson correlation analysis

Table 7: Pearson Correlation Results Between Key Constructs

Construct Pair	r-value	p-value	Interpretation
PU ↔ SAT_BI	0.81	0.000	Perfect positive correlation
PEOU ↔ PU	0.72	0.000	High positive correlation
PEOU ↔ ENG	0.61	0.002	Moderate positive correlation
ENG ↔ SAT_BI	0.74	0.000	High positive correlation
PU ↔ ENG	0.59	0.004	Moderate positive correlation

1. **PU**: Perceived Usefulness
2. **PEOU**: Perceived Ease of Use
3. **ENG**: Engagement

4. **SAT**: Satisfaction
5. **BI**: Behavioural Intention

The correlation analysis indicates strong relationships between the key constructs in the study. A perfect positive correlation is observed between Perceived Usefulness and Satisfaction & Behavioural Intention ($r = 0.81$, $p < 0.001$), suggesting that students who find H5P learning materials useful are very likely to express satisfaction and intent to continue using them. The link between Perceived Ease of Use and Perceived Usefulness is also strong ($r = 0.72$), showing that ease of use plays a major role in shaping how students perceive the usefulness of the tool.

Moderate correlations are evident between Perceived Ease of Use and Engagement ($r = 0.61$) and between Perceived Usefulness and Engagement ($r = 0.59$), indicating that ease of navigation and tool efficiency moderately support student involvement. A high positive relationship between Engagement and Satisfaction & Behavioural Intention ($r = 0.74$) further confirms that engaged students are more satisfied and motivated to continue using the platform. These values, all statistically significant, support the overall coherence and predictive strength of the models.

Qualitative Findings

Table 8: Thematic Summary of Student Feedback on H5P-Based Learning Experience

Question	Key Themes Identified	Summary Statement
Engagement & Effectiveness	Visual learning support, interactive reinforcement, better retention, active engagement	Interactive H5P elements like videos and quizzes enhanced understanding and made content more memorable.
Usability	Ease of use, minimal technical issues, occasional mobile compatibility problems	Most students found the tools easy to use, with only minor technical or usability issues reported.
Satisfaction & Experience	Motivation, gamification, design appeal, feedback usefulness, flexibility	Students appreciated the engaging format, especially instant feedback and appealing design elements.
Challenges	Connectivity issues, content clarity, pacing difficulty, device limitations	Challenges mainly stemmed from technical problems, unclear content, or difficulty managing study time.
Improvement Suggestions	Subtitles, clear instructions, mobile compatibility, more examples, progress tracking	Students suggested improvements such as better mobile support, clearer instructions, and more examples.

A dedicated analysis of mobile compatibility and device limitations would provide a deeper understanding of the technical challenges experienced by students. Although the majority of participants indicated that the H5P tools were straightforward to use, reports of mobile compatibility issues highlight potential barriers that could affect user experience. Where possible, quantifying the prevalence of these issues would enhance the reliability of the findings and provide actionable data. Such insights would be valuable for platform developers seeking to optimise cross-device usability and for instructors aiming to adopt tools that function effectively across a range of devices frequently used by students.

Pacing difficulty emerged as a key challenge, suggesting that some students struggled to manage their time effectively or align their study pace with the structure of the H5P activities. This issue may be linked to a lack of clear time estimates, inconsistent activity lengths, or insufficient guidance on expected effort per task. Investigating these factors more closely—through targeted survey items or follow-up interviews—could help identify patterns in how learners engage with content. Insights from such analysis would support instructional design improvements, such as integrating adaptive learning paths, offering optional pacing guides, or embedding clearer time expectations within each activity to support self-regulation.

Table 9: Frequency of Student Feedback Sub-Themes Categorised by Key Themes
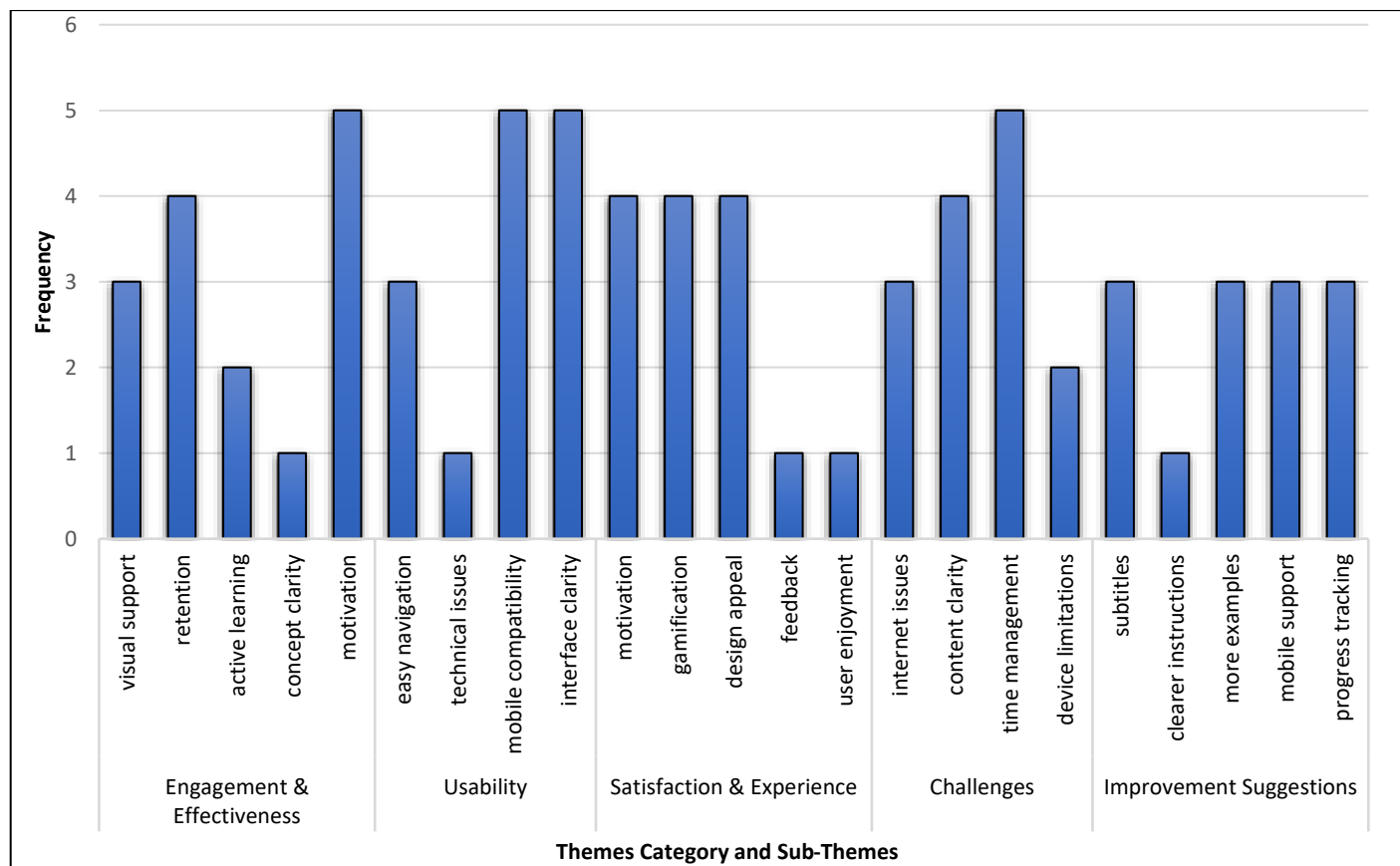
The reflective responses reveal that students found the H5P interactive materials highly beneficial for learning in an Open Distance Learning setting. Most notably, elements like visual support and interactive reinforcement contributed to stronger concept retention and deeper engagement, as reflected by frequent mentions of motivation and active learning. These themes were reinforced in the thematic analysis, with "motivation" and "retention" showing the highest frequencies under the Engagement & Effectiveness category. Students reported that the quizzes and videos not only helped clarify complex project management ideas but also made the learning experience more dynamic and enjoyable.

In terms of usability, the feedback pointed to mostly positive experiences, with many respondents describing the materials as easy to navigate. Sub-themes like "easy navigation" and "mobile compatibility" emerged prominently, indicating that while the platform was generally accessible, improvements were needed for better mobile device performance. Minor issues such as technical glitches and unclear instructions were noted but did not significantly detract from overall satisfaction. Suggestions for improvement—such as adding subtitles, clearer activity instructions, and progress tracking—suggest students are open to continued use of H5P if enhancements are made to address accessibility and usability concerns.

CONCLUSION

The findings of this study affirm that H5P interactive learning materials contribute positively to student engagement, satisfaction, and learning experience in an Open Distance Learning (ODL) environment. Most students responded favourably to the usability and perceived usefulness of the H5P tools, with survey data showing consistently high mean scores across the key constructs. Learning analytics supported this perception, revealing high participation and interaction rates with the H5P activities. Qualitative responses further reinforced these outcomes, with many students appreciating the visual and interactive elements that enhanced their understanding of project management concepts. The inclusion of videos, quizzes, and feedback mechanisms was particularly noted as effective in maintaining motivation and supporting content retention. These findings suggest that incorporating H5P can strengthen the quality of digital course delivery, especially in content-heavy subjects requiring decision-making and problem-solving skills.

The quantitative and qualitative findings show that students responded positively to the H5P learning materials across usability, perceived effectiveness, engagement, and satisfaction. Descriptive statistics reflect high mean scores (4.32–4.49), indicating strong agreement that the materials were easy to use, helpful, and motivating. Actual use data supports this, with most students completing several or most of the activities. Reliability analysis confirms good to excellent internal consistency across all constructs, and correlation results show moderate to perfect relationships between key variables, especially between perceived usefulness and satisfaction. Qualitative feedback reinforces these outcomes, highlighting that interactive features improved engagement, concept retention, and motivation. Although students reported minor technical and clarity issues, they remained open to future use and suggested enhancements like subtitles, mobile support, and clearer instructions.

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