Facilitating student engagement and achievement with interactive H5P videos: A case study on a Y2 EAP module

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Editor comment	Author response
First, Figure 2 should be presented as a correlational table. Instead of taking the SPSS-generated output table as is, please follow the sample correlational table at: https://apastyle.apa.org/style-grammar-guidelines/tables-figures/sample-tables	Thank you for letting us know. The SPSS-generated output table on page 19 has been replaced with a correlational table following the guidelines on APA style and has been labelled as 'Table 1. Descriptive Statistics and Correlations for the study variables' (page 19).
Second, some of the references are jumbled	Thank you for the comment, and we apologise for the oversight. The reference list has now been reorganised in places. For example, the reference to Jacob & Centofanti (2023) has been moved to appear before Jones & Hafner (2021) in the reference list.
Third, the doi's for Le, Allen & Johnson (2002) and Mayer (20211) are incorrect	DOIs for Le, Allen & Johnson (2022) and Mayer (2021) have been replaced and are now all functional.
Fourth, the book title for Reinders & Nakamura (2021) is incorrect	The book title for Reinders & Nakamura (2021) has been replaced. This was previously 'The Routledge Handbook of Language Learning and Teaching' but has been changed to 'The Routledge Handbook of the Psychology of Language Learning and Teaching'
Fifth, for Wong & Nunan (2011), provide the following weblink: https://jltl.com.tr/index.php/jltl/article/view/45	Thank you for providing a more up-to-date link to Yao & Li (2017). We were unable to find this in previous literature reviews.

	This has now been added to the reference for Yao & Li (2017).
Finally, please proofread your manuscript closely to remove all remaining issues	Thank you for the comment. The manuscript has been further proofread, and issues with citations and references have been found and corrected. For example, Kajan et al. (2025) did not previously appear in the reference list, having been included as part of major revisions. Lin & Reinders (2018), Fisher et al. (2021), and Ma & Lee (2021) also had incorrect years in some citations.

Abstract:

Blended learning is a relatively new approach to promoting digital literacy and improving learning outcomes in English for Academic Purposes (EAP). This approach integrates face-to-face and online learning, with students engaging in multimodal activities on a Virtual Learning Environment (VLE), such as Moodle, alongside activities in the traditional EAP classroom. However, the online component of the blend is often limited by low student uptake, limited satisfaction, and unclear learning outcomes. Our study, therefore, sought to increase online engagement and academic performance by integrating interactive HTML5 (H5P) videos into the institutional VLE platform, enabling students to engage with content flexibly, both within and beyond the classroom. Using Moodle analytics data (N=107), test scores from formative assessments, and semi-structured interviews (N=13), we investigated student engagement, satisfaction, and academic performance at a transnational university in China. Results from observations and interviews suggest

increases in cognitive, behavioural, and affective engagement. This appears to have translated into improved academic performance as evidenced by a correlational analysis of Moodle engagement and test scores. We therefore conclude by highlighting the usefulness of interactive H5P videos for increasing engagement and academic performance on an EAP course.

Introduction:

Since the release of ChatGPT and other Generative AI (AI) platforms, there has been a surge in research on the application and ethics of AI use in Education and EAP with a scan of JEAP revealing a focus on the role of AI in independent language learning (Zou et al., 2025), academic paraphrasing (Xu & Zheng, 2025), and in fostering critical thinking (Hu et al., 2025). However, other digital tools have been relatively overlooked and under-researched. One such tool is interactive H5P activities, which allow the creation of open-source, rich, multimodal resources, including pop quizzes and interactive videos that have been shown to improve learning outcomes (Jacob & Centofanti, 2023) and engagement with various aspects of the academic writing process (Yao et al., 2024).

Following the COVID-19 pandemic, higher education institutions worldwide have been experimenting with online, blended, and flipped learning models to provide learners with greater flexibility (Ma & Lee, 2021) and extend learning beyond the classroom (Li, 2025). This has generally involved using Virtual Learning Environments (VLEs), such as Moodle or Blackboard, on which course materials can be delivered asynchronously or before class (Ma & Lee, 2021). However, student engagement and satisfaction with the online components of the blend have often been limited due to a lack of social interaction, self-regulation skills, or sustained motivation for independent language learning, which may lead to superficial

technology use without appropriate support (Stockwell & Reinders, 2019; Le et al., 2022; Sareen & Mandal, 2024). This may be due to a lack of “truly blended learning,” in which predominantly offline courses are complemented by supplementary materials on a VLE platform such as Moodle or Blackboard (Crosthwaite et al., 2021). However, student engagement with the online components of blended and flipped learning has also been found to be limited, leading to unstructured learning and poorer outcomes.

A blended learning model in which interactive H5P videos are thoughtfully integrated with face-to-face instruction on an institutional VLE platform (Garrison & Kanuka, 2004) may effectively respond to such concerns while providing opportunities for social interaction and the development of self-regulation skills (Bower, 2019; Garrison, 2017). Indeed, systematic research by Brewer and Movahedazarhouligh (2018) indicates that blended learning could have significant positive effects on satisfaction, student engagement, and the achievement of learning outcomes on EAP or EFL courses. The thoughtful integration of digital technology into the curriculum could further provide students with access to differentiated, learner-centred materials that promote digital and AI literacies and prepare them for increasingly digital jobs of the future (Fisher et al., 2021; Kirschner & De Bruyckere, 2017). However, for blended learning to be effective, the online components of the curriculum need to be carefully integrated with face-to-face components with an understanding of learners' preferences and readiness to engage with technology, as well as their role within the wider curriculum (Wong et al., 2014; Stockwell & Reinders, 2019).

Using open-source H5P (HTML5) tools, interactive videos with embedded pop quiz questions and links can be developed to promote learner comprehension on a Moodle platform (Jacob & Centofanti, 2023). Integrating these into an English for Academic Purposes (EAP)

curriculum is believed to be more engaging than traditional blended learning models, as it affords flexible interactions with content, promotes active learning, and improves learning outcomes (Yao et al., 2024). However, to date, few studies have focused explicitly on the effectiveness of interactive H5P videos in improving student engagement and academic performance holistically. This matters because insufficient engagement and participation in both the online and face-to-face components are likely to limit the effects on learning outcomes and satisfaction.

At transnational universities in China, students often struggle with time management and self-regulated language learning (Kajan et al., 2025). Compared with traditional universities, these challenges are amplified, as students struggle with comprehension issues and limited communication skills, and have limited experience with independent learning (Yang et al., 2025; Ergenc, 2020). Reasons for this include passive learning experiences (Wang & Ryan, 2020), limited readiness for learner autonomy (Lin & Reinders, 2018), and an educational environment that allows few opportunities for real language use (Yao & Li, 2017). Readiness for technology-enhanced learning and teaching is also important to consider. Even when students are considered digital natives with sophisticated technical skills, their ability to use technology for educational purposes is likely to be limited (Kirschner & De Bruyckere, 2017). Teacher support and training in the use of devices for educational purposes, as well as engagement in social engagement in interactions, are therefore essential for achieving learning outcomes and maintaining satisfaction (Bower, 2019).

Considering these factors, the study was conducted at a transnational Sino-British university in mainland China to investigate how blended learning with interactive H5P videos could improve student engagement with modular learning outcomes and performance or

attainment in ongoing formative assessments. In this context, learner engagement is conceptualised as a holistic construct comprising overlapping behavioural (action), cognitive (thinking), and affective (feeling) dimensions.

As such, this case study focuses on the effect of such interactive H5P videos on student engagement across behavioural, cognitive, and affective dimensions, as well as on performance in formative in-class assessments. The overall research questions are:

- To what extent can interactive H5P videos affect student engagement and satisfaction on an EAP for mathematics course?
- To what extent can engagement with interactive H5P videos improve student performance in course assessments?

Literature review

Blended learning has been conceptualised along a continuum to date; therefore, it is important to consider how the affordances of H5P activities fit within this framework. These will be discussed with reference to an EAP for mathematics course at a transnational Sino-British university.

2.1 Blended learning

Universities frequently use blended learning models to integrate digital content, such as lectures and study guides, with face-to-face provision (Ma & Lee, 2021). While there is no single definition of blended learning, and the exact blend depends on institutional and social contexts, it generally involves a combination of pedagogical approaches and multimodal learning to promote student-centred, active, and self-regulated learning (Brewer & Movahedazarhouligh, 2018). One common definition is the thoughtful integration of face-to-

face and online instruction or learning experiences" (Garrison & Kanuka, 2004, p. 96) with a degree of student control over the time, place, and pace of engagement with the online components (Graham, 2019). While the duration and pace of engagement are likely context-dependent, this involves a combination of audio, video, text, and other modalities available within a Virtual Learning Environment (VLE), such as Moodle or Blackboard (Gruba et al., 2016). Multimodal, interactive H5P videos could readily be integrated into such a platform to support the online component and motivate students to complete activities.

Blended learning frequently employs a variety of digital media, including text, audio, and video, to facilitate instruction and multimodal communication, and students likely learn more and better from an approach that combines these with new and student-centred forms of interaction (Bouchey et al., 2021; Jones & Hafner, 2021). There are multiple advantages of multimodal instruction in EAP, including enhancing student participation by providing new interaction patterns and ensuring that students can understand concepts and construct meaning through digital media such as audio and video (Querol-Julián, 2023). With multimodal and interactive videos, learners could therefore be provided with affordances for flexible, accessible, and digitally mediated construction of meaning in their own time and at their own pace. This would further ensure higher levels of engagement for digitally native students while promoting digital literacies and facilitating the development of self-regulated learning (Kirschner & De Bruyckere, 2017; Reinders et al., 2023).

In practice, blended learning often involves a combination of behavioural exercises, reflective tasks, and forum discussions on a Virtual Learning Environment (VLE) such as Moodle. With a flipped approach, these activities would normally be completed prior to class, allowing teachers to focus on feedback and communicative activities. However,

undergraduate students often fail to complete tasks and activities before class (Le et al., 2022); therefore, a blended learning approach with flexible in-class and out-of-class engagement with digital activities may be more suitable for students who are relatively new to higher education. When audio, video, and text-based activities are hosted on a VLE platform, both teachers and students are afforded greater flexibility in in-class interactions (Graham, 2019). Additionally, research has found that when parts of the course are delivered asynchronously, perceived satisfaction, in-class engagement, and learning outcomes, as measured by assessments, have improved (Fisher et al., 2021; Ma & Lee, 2021; Jacob & Centofanti, 2023). This is likely due to the affordances these approaches offer students for engaging with the material before and after communicative in-class activities.

A blended learning approach can also ensure that students are provided with the academic and digital skills required to engage effectively with course content outside the classroom (Brewer & Movahedazarhouligh, 2018). This commonly involves utilising lecture recordings, relevant videos, reading materials, and workbooks to deliver course content, enabling learners to engage with it both in their own time and in the classroom (Brame, 2016; Anthony et al., 2022). Teachers and students are therefore provided with more time for communication, interaction, and feedback as part of active and reflective learning within the classroom, in ways that research has shown to increase productivity and improve learning outcomes (Lai & Bower, 2019; Reinders & Nakamura, 2021). Interactive videos also enable flexible, differentiated learning at students' own pace, allowing learners to adjust audio or video speed, receive immediate feedback, and take as much time as they need (Mayer, 2021). This is particularly effective with brief, focused 6-minute video content, where cognitive load can be reduced, engagement increased, and learning maximised (Brame, 2016).

One of the main benefits of blended learning is the affordances it provides for increasing student engagement and improving learning experiences (Kirkwood & Price, 2014). In this context, engagement could be defined as the active realisation of intrinsic motivation and includes behavioural, affective, and cognitive dimensions that are all important for learner achievement, motivation, and self-efficacy (Mercer, 2019; Reinders & Nakamura, 2021). Specifically, cognitive engagement involves reflection and self-regulation, while affective engagement includes personal or emotional responses and willingness to interact in the language. Finally, behavioural engagement includes effort spent on task, persistence, and other aspects that a teacher might readily observe in the classroom. These should be considered holistically with considerable interaction between cognitive, affective, and behavioural dimensions (Zandi et al., 2025), both within and beyond the classroom.

These benefits, including increased attention, satisfaction, and engagement, align with a social constructivist approach that emphasises adaptive and personalised learning within cohesive communities, with ongoing reflection to test and confirm understanding (Jacob & Centofanti, 2023; Zhan et al., 2026). However, self-regulated learning is also essential for success beyond the classroom and has been associated with improved learning outcomes and performance (Yang et al., 2025). Since the affordances of educational technology for motivation and autonomy depend on a degree of learner autonomy and community (Graham, 2019), and considering limited student readiness for self-regulated learning, activities should be carefully integrated into the curriculum and supported to provide opportunities for communication and reflection (Bower, 2019; Stockwell & Reinders, 2019). To this end, interactive H5P videos were selected, developed, and integrated into a modular Moodle-based platform accessible to all students and teachers for teaching and learning. H5P videos were also carefully integrated into EAP classes on Moodle, and students were

encouraged to engage with them beyond the classroom. This enabled teachers to provide instruction, feedback, and real-time support during class, while students had flexible, on-demand access to resources to support their learning outside class.

2.2 Interactive H5P videos

H5P is free and open-source content-creation software that allows users to create rich and interactive HTML5 content that can be embedded within a Virtual Learning Environment (VLE) such as Moodle or Blackboard (The H5P Group, 2025). These activities, including interactive presentations, videos, and educational games, have been found to promote active, student-centred learning (Jacob & Centofanti, 2023). When combined with in-class discussions and feedback, active blended learning as facilitated by interactive videos may improve academic performance and comprehension compared with traditional lecture-based instruction (Yannier et al., 2021).

Interactive H5P videos, including pop quiz questions and links to additional details, appear particularly effective in increasing engagement and academic performance because they provide opportunities for flexible, personalised learning with immediate feedback (Yao et al., 2024; Guaña-Moya et al., 2024). Short, interactive H5P videos may also effectively address low participation rates while encouraging students to engage more actively with course content and assessments. Such engagement correlates with intrinsic motivation and is likely to translate into improved learning outcomes and academic performance (Jacob & Centofanti, 2023; Wilkie et al., 2017).

With interactive videos, students can be provided with enhanced affordances to take control and responsibility for their own learning (Vaughan et al., 2013) while replaying or reviewing relevant content in a multimodal format, thereby mitigating cognitive load (Noetel et al.,

2021). This is likely to be more engaging and motivating than text- or image-based content, particularly for digitally native learners (Reinders et al., 2023; Tugtekin & Dursun, 2022). Interactive videos could further be readily integrated with generative AI to provide learners with scaffolding and guidance for developing AI and digital literacy skills in a semi-controlled environment. Responding to limited learner autonomy among many Asian students (Lin & Reinders, 2018), gamified features of interactive H5P content, such as stars, points, and leaderboards, could effectively increase motivation to engage with these outside the classroom (Huang & Hew, 2015), while teachers can provide training and support in the classroom (Wong et al., 2014). A summary provided at the end of the videos also enables students to identify areas of strength and weakness in their learning, thereby promoting their confidence and motivating them to seek further practice and support. This could maximise learning while providing improved opportunities for active and student-centred learning (Gruba et al., 2016; Kirchner & de Bruyckere, 2017).

2.3 Formative Assessment

Assessments have a major impact on learning, and formative Assessment for Learning (AfL) or Assessment as Learning (AaL) could promote active learning and improve learning outcomes and student interactions (Schellekens et al., 2021). Assessment for Learning (AfL) refers to the use of assessment to improve learning and teaching. In contrast, Assessment as Learning (AaL) views students as actively engaged in self-regulated learning, with assessments integral to this learning (*ibid*). Both assessment formats could be facilitated with a blended learning approach. Within an EAP context, formative assessments, such as in-class tests and interactive activities, can be integrated to provide learners with ongoing,

immediate feedback and support. For the duration of this study, only formative assessments were administered; therefore, summative assessments were not considered relevant.

A particular benefit of Assessment for Learning or Assessment as Learning is the promotion of self-regulated learning and student-centred decisions about feedback (Dann, 2013). In blended learning, interactive activities can enable learners to engage more flexibly with peer and tutor feedback, accommodating diverse learning styles and paces. Additionally, timely and relevant feedback can help learners identify areas for improvement and promote greater engagement (Zeng et al., 2018). Thus, with explicit delivery and carefully scaffolded instruction, technology-enhanced learning enables students to develop self-regulation and become more accountable for their learning (Yang et al., 2025). While student engagement with any feedback is complex and dependent on the type of feedback, students who engage with feedback are likely to become more behaviourally, cognitively, and affectively engaged with course content (Zhang & Hyland, 2022).

Methodology

This case study involved interactive H5P videos covering relevant skills and knowledge, aligned with formative assessments on the module, which were introduced biweekly as part of an intervention to promote greater student engagement. These H5P videos included general videos on referencing and source integration, as well as specifically tailored videos to prepare students for writing coursework and a tutorial discussion. Together with feedback and other preparatory resources, these were provided on the modular Moodle platform, and the affordances of these videos were maximised by integrating videos closely with the curriculum and in-class content.

A mixed-methods approach was used for data collection, including Moodle activity completion logs, access frequency logs, formative in-class test results, and semi-structured panel interviews. Researchers, including Duff (2011) and Tashakkori & Teddlie (2013), highlight the importance of studying an individual student, a group, or a phenomenon in depth within their natural context, and of considering the perspectives of all participants, including the researchers, who were also teachers. Panel interviews were therefore used to explore engagement and satisfaction with the provided H5P videos. These interviews also enabled us to explore learners' preferences and study skills, as well as the limitations of using interactive H5P videos both within and beyond the EAP classroom. By triangulating findings from learner analytics data, this approach provided deeper, more fine-grained insights into how interactive H5P videos improve access to learning resources and support self-regulated learning, and how these, in turn, affect learning outcomes and academic performance.

3.1 Participants

The study was conducted during semester 1 of the 2023-2024 academic year and involved 107 second-year undergraduate students at a transnational Sino-British university. For the panel interviews, a convenience sample of 13 of our own students was used, all recruited from a mandatory English for Specific Academic Purposes (ESAP) course for mathematics. As a study involving our own students, we were able to observe participant engagement in real time and recruit for panel interviews. All participating students were provided with information sheets and opportunities to ask questions both in and out of the classroom, and ethical approval was obtained from the institution before any data collection began.

All participating students were studying the EAP module alongside discipline-specific courses as part of 3 different degrees: Financial Mathematics, Applied Mathematics, and Actuarial Studies. Language proficiencies corresponded to approximately CEFR B1+ to B2 in semester 1, with an expectation of B2+ by the end of the following semester. The course was 13 weeks, and interactive H5P videos were provided biweekly on the modular Moodle pages. H5P videos were primarily delivered asynchronously, and students were expected to access them and other course content in a self-directed manner. However, as part of the blended learning model, students were also allocated designated time periods to access H5P videos in the classroom where possible.

Research design:

A needs analysis was conducted at the start of the academic year and involved course handbooks, task sheets, and the outline of their EAP course. Based on the identified needs and learning outcomes, videos were designed, and topics included finding and evaluating academic sources, referencing and reporting verbs, the peer review process, tutorial engagement, and general tips for writing and speaking coursework. These topics were explicitly chosen to prepare students for formative written coursework, an in-class test (ICT-1) on referencing and academic integrity, a tutorial discussion on writing coursework (ICT-2), and a spoken presentation. In addition to skills-based videos, videos on relevant academic topics that students may find interesting were also sourced from YouTube.

Having identified and developed relevant skills- and topic-based video scripts, short videos were recorded and edited using TechSmith Camtasia (TechSmith, 2024). In line with research on reducing cognitive load, videos were intentionally kept relatively short at 6 to 8 minutes (Brame, 2016), and feedback and open-ended questions were used to encourage reflection

and active learning (Yannier et al., 2021). Since the researchers were also teachers, we were able to grade instructions and explanations according to learners' proficiency levels and knowledge, drawing on our experience and observations. While ethical considerations regarding a power imbalance may have introduced bias, only formative assessments were provided during the semester, and all data were collected after all teaching and assessments had concluded.

Videos were subsequently edited to improve audio and video quality and to increase engagement with key segments by highlighting them with annotations and visual effects. Next, videos were uploaded to an institutional and modular Moodle platform, and H5P content, including pop-quiz style questions, links to key documents and resources, and bookmarks, were added to facilitate engagement, reflection, and self-regulated learning. Finally, an application was added to Moodle to provide students with convenient, flexible access to H5P videos, both in and beyond the classroom.

Data Collection

Learner analytics data from Moodle, including descriptive and diagnostic data on learner completion and performance, as well as frequency-of-engagement data, activity completion logs, and time spent on tasks, were downloaded for all 107 participating students and subsequently edited for further analysis. Activity completion logs and time spent on task were limited, however. It was postulated that students did not usually complete videos in their entirety but instead focused on the sections they deemed most relevant, a finding later confirmed in panel interviews with participating students.

Semi-structured panel interviews with 13 students further provided data on student engagement and satisfaction. As needed, questions were simplified, and translations to

students' L1 (Mandarin Chinese) were provided to ensure understanding and validity of responses (Cohen et al., 2018). These interviews drew on initial quantitative findings and explored how the H5P videos were used, the types and levels of engagement, what was learned, and preferences for future use. Participating students were also asked to rate the provided H5P videos on a scale from 1 to 5 and explain their ratings, thereby providing additional quantitative data. Being aware of potential bias, we hoped to mitigate it through panel discussions with groups of students, which we hoped would provide peer support when discussing and answering questions.

These metrics enabled an examination of correlational assumptions regarding the use of H5P videos for improved performance in two formative assessments. In this study, we define performance as the attainment of learning outcomes in in-class test 1 and in-class test 2. The validity of this quantitative data was largely derived from data collection from a Virtual Learning Environment that was expected to be used by all students in the module. Furthermore, panel discussions sought to address limitations in Moodle analytics data, such as students completing videos together with peers or sharing devices.

Data Analysis

After data collection, quantitative data were edited and compiled for statistical analysis. Using SPSS 2022, a correlation analysis was conducted between the frequency of engagement with 6 H5P videos and performance on formative in-class tests (I-CTs). Results were subsequently updated to exclude outliers who did not access videos or complete formative in-class tasks. The duration spent on each video and activity completion records for H5P videos were also excluded due to incomplete analytics data.

An exploratory sequential design was employed to enhance the validity of the analytic results (Creswell & Plano Clark, 2018). This involved collecting quantitative Moodle analytics data over a 13-week semester, followed by analysis to reveal correlations between H5P video access, engagement, and academic performance. Finally, qualitative data were collected and analysed to explain and extend the first-phase quantitative results, ensuring methodological and temporal triangulation over a full semester, thereby increasing reliability (Cohen et al., 2018).

For the frequency of engagement with In-Class Task 1 (ICT-1), 3 students were excluded due to insufficient data. However, no students were excluded from the performance analysis in In-Class Task 2 (ICT-2). To address limited access, frequency was defined as the proportion of videos accessed within 2 hours. This excluded multiple access attempts in which students may have refreshed their browsers or logged in on an alternative device to ensure greater reliability of the findings.

Qualitative interview data were manually transcribed and edited to maximise granularity and facilitate deeper analysis. As such, pauses and hesitations were included in the transcript where possible, and the speaker contributing to the discussion was clarified. Since this was not a linguistic analysis, prosody and specific linguistic features were not considered; instead, the data were explicitly coded and thematically analysed (Braun & Clarke, 2022). This involved an iterative construction of relevant and meaningful themes from the transcribed and coded data, enabling the researchers to explore perceptions of the current and future use of interactive H5P videos in EAP (*ibid*). These themes are summarised in Figure 1 below.

Figure 1. Major codes, sub-themes and themes related to RQ1 and RQ2.

Results

4.1 **Quantitative results**

Descriptive statistics for a sample of 107 participating students indicated mean performance scores of 78.61 for in-class test 1 (ICT-1) and 67.89 for in-class test 2 (ICT-2), with standard deviations of 19.36 and 23.40, respectively. While these test scores were not directly comparable due to In-Class Task-1 (ICT-1) being a multiple-choice quiz and In-Class Task-2 (ICT-2) being a tutorial discussion, a paired sample T-test was conducted to determine whether results could be explained by a difference in frequency of engagement with H5P videos 1-3 (ICT-1) and H5P videos 4-6 (ICT-2). Results show that the mean frequency of engagement was significantly different ($t(106) = -2.941$, $p = 0.04$), with a 95% confidence

interval. This indicates that frequent use of H5P videos is directly correlated with in-class test 1 scores at the 95% confidence level.

A correlation was found between the frequency of engagement with H5P videos 1-3 and performance in ICT-1 (r = .240, *p = .013*), as shown in Table 1 below. As such, frequent access to H5P videos was somewhat correlated with performance in in-class test 1 with 95% certainty. Engagement with H5P videos 1-3 was also correlated with performance in ICT-2, but these positive correlations were relatively low and not considered significant (r = .200, p = .038) using the same confidence interval. As such, more frequent access to interactive videos appears to be moderately correlated with performance on in-class tests, but this association is limited by the large number of students who did not access any videos. Further correlation analysis revealed that the frequency of engagement with H5P videos 4-6 and performance on in-class test 2 (ICT-2) were moderately positively correlated with ICT-1 (r = .316, p = .001). This is particularly noteworthy, as ICT-2 consisted of a tutorial discussion on formative written coursework, and scores in the formative tutorial discussion were more likely to have been influenced by teacher bias and prior work on the module than by engagement with interactive H5P videos.

When outliers who did not access videos or complete formative in-class tasks were excluded, the correlation between video engagement and videos 1-3 weakened (r = .233), whereas the correlation with videos 4-6 strengthened (r = .193). A significant correlation was also found between the completion of videos 1-3 and performance on in-class task 2 (r = .288), which could reflect the longer timeframe and affect later performance. These correlations were subsequently explored in further detail through panel interviews with participating students.

Quantitative data from subsequent interviews indicated high self-reported satisfaction, with an average score of 4.26 on a 1-5 scale. This likely correlates with increased engagement with H5P videos and improved assessment performance and could be interpreted as positive for future iterations of blended learning with H5P videos. This was explored further during the panel interviews, and the results are reported below.

Table 1. Descriptive Statistics and Correlations for the study variables.

Variable	N.	M	SD	1	2	3	4
1. Frequency 1	107	2.01	1.91	–			
2. Score ICT-1	107	78.61	19.36	.240*	–		
3. Frequency. 2	107	2.62	1.57	0.97	.244*	–	
4. Score ICT-2	107	67.89	23.40	.200*	.414**	.316**	–

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

4.2 Qualitative results

Semi-structured panel interviews with participating students revealed varying degrees of behavioural, cognitive, and affective engagement, and that most learners were predominantly extrinsically motivated by exams and assessments. This was anticipated in the video creation process, and most videos were directly related to formative assessments, including in-class tasks, writing coursework, and speaking coursework. Major findings regarding student engagement and assessment performance are summarised below, with reference to selected extracts from transcripts of recorded interviews. As such, multiple students commented that they were engaged and motivated, but only a few quotes have

been included for brevity.

Student Engagement

The average satisfaction score was 4.26 on a scale from 1 – 5, and participating students highlighted the novelty of the videos, their usefulness in preparing for assessments, and opportunities for comprehension checks as areas of satisfaction. The novelty of the videos appeared to increase satisfaction and engagement as evidenced by statements like "*it is quite new for me, and I haven't got anything like this before, so, I quite like it*" (student 5) and "*the video is really interesting and let me more easy to prepare my… in-class-test and the coursework or the exam*" (student 11). The videos also appeared useful for reviewing and confirming understanding in preparation for assessments, as evidenced by comments such as "*it [the H5P video] helped me to check my understanding of the content of the videos*" (student 6), highlighting their use for reviewing and confirming understanding of knowledge in preparation for assessments. In contrast, completing frequent gap-fill exercises may have impeded progress due to occasional spelling and word-choice errors, and content-based videos were sometimes difficult to follow. For example, student 1 explained their frustrations with having to type the correct answer "*but I can only, you know, type the correct one so that I can continue*" and not being able to fully understand the content [of the videos] was seen a source of frustration in comments like "*students who just did not like it, they, they may think just don't understand and don't like it*" (student 6). Overall, panel interviews indicated varying degrees of behavioural, cognitive, and affective engagement among participating students, which will be explored in the following sections.

It's not difficult, you know, some words have different, like similar meanings, but different words, but I can only, you know, type the correct one so that I can continue.

– student 1

… this topic is is out of the report, report verb, report verb, and it just depends on the interests of students and how they how they feel interest of it and if they are just interested in it, they will… try to just understand it more but for those students who just did not like it, they, they may think just don't understand and don't like it, so I think it will be the, maybe they're less useful…

– student 11

I think it helped me to check my understanding of the content of the videos, yes… if it is just a normal video and I just look it through… I won't know how much I understand the content…

– Student 6

Behavioural engagement

Students did not appear to spend much time taking notes either while or after engaging with the H5P videos, with a few exceptions. One higher-proficiency student commented, "*we didn't do any notes because we have done it in last semester. We have recorded it*." (student 3), while another mentioned that he would "*sometimes will take notes to help me to understand and… record it*." (student 2*).* By contrast, several lower-proficiency students mentioned laziness as an excuse for not taking notes, saying "*no… [taking notes] because I, I,*

I'm not… hmm, I'm lazy to do that, yeah…" (student 8) or only noting key words "*Yes… Yes, I have… I will know some important word…*" (student 10). Considering that most interview participants had higher proficiency than the perceived class average, only a small proportion of participating students likely took notes during or after interacting with the videos. Where notes were taken, these appear to have been limited to certain keywords, such as key vocabulary, links to further information and documents, and the general outline of the video. For example, student 10 commented that *"… I will know some important word*" regarding the benefits of taking notes.

By contrast, most students appeared to interact with videos by skipping sections and questions perceived as less relevant, repeating the video as necessary, and spending an average of 10 to 15 minutes on each video. For instance, regarding time spent on the videos, student 7 mentioned, "*Because if I get it wrong, I will… watch it again*" or replay (sections) of the video multiple times to arrive at the correct (sic) answer. Each H5P video ranged from 5 to 8 minutes, and on average, students spent 10 to 15 minutes watching each video, with an additional 5 to 10 minutes on answering questions, replaying segments, and (in some cases) taking notes. Finally, H5P videos were reportedly used as a review tool to aid in their recollection of previously taught content and skills and one student in particular mentioned that they would "*[firstly]… review her PPT but if there are some… something that make me confused, then maybe I will get to the Learning Mall and look at those videos, maybe it can help me to realize better…"* (student 3).

> *" When I saw… when I work, I'm watching some difficult videos, I sometimes will take notes to help me to understand and… record it… I will, I will revise it and…"*

– Student 2

"Uh, yes, I think those videos can help us, especially after class, because maybe in class [Teacher name] told, teach us, and after class when I write my FWCW maybe I will… review her PPT but if there are some… something that make me confused, then maybe I will get to the Learning Mall and look at those videos, maybe it can help me to realize better…"

– Student 3

"No…. Because I, I, I'm not… hmm, I'm lazy to do that, yeah… I think if it's, it's required it's, it's, it's a… a comment, uh, recommended to do the some notes, I think teachers can send some emails before the classes to ask we brought, bring the paper or pens and the… the…"

– student 8

Cognitive engagement

While cognitive engagement is related to more readily observable behavioural engagement, this dimension is particularly concerned with students' reflection, memory, and the application of skills and concepts from H5P videos. A significant difference could be seen between lower and higher-proficiency learners in terms of how they understood the videos, with one lower-proficiency learner commenting that "*it's, it's like an IELTS listening test with a video…*" (student 8) and another agreeing, explaining that "*Yes, I also… firstly, I treat the video as a listening test, but I found it a little difficult for me…*" (student 10). By contrast, some stronger students were able to evaluate and apply skills to other assessments, written

tasks, and modules. For example, on the topic of academic sources, one student highlighted the usefulness of a video, explaining "*that is very useful for me, because not only I write, I find sources using the method […], but I also find some sources in the research with my lecturer in CPT [computer science] class…"* (student 6). Others mentioned using H5P videos to help them review, remember, and better understand what had previously been taught in class, as evidenced by statements like "*after class when I write my FWCW [formative writing coursework], maybe I will […] look at those videos, maybe it can help me to realize better…"* (student 3*).* Similarly, expressions about being motivated to perform better in tests and coursework were common as evidenced by statements like "*maybe the preparation for the In-Class Test 2 [most useful], because I am a person who is cared about my… tests, so I concerned about it and it is not only give me the, the question type of In-Class Test 2, it also give me what you want to test us, and I know more about it, and maybe I will prepare well…".*

> "*Uh… it's, it's like an IELTS listening test with a video…"*
>
> – ***Student 8***

> *"That is very useful for me, because not only I write I find sources using the method, method in the, in the video, in the EAP class, but I also find some sources in the research with my lecturer in CPT [computer science] class…"*
>
> **– student 6**

> *[Most useful video] "Maybe the preparation for the In-Class Test 2, because I am a person who is cared about my… tests, so I concerned about it and it is not only give me the, the question type of In-Class Test 2, it also give me what you want to test us,*

and I know more about it, and maybe I will prepare well…"

– Student 7

Affective engagement

As an important component of engagement, students' affective responses and willingness to engage with H5P videos and peers are essential. Aside from the significant minority of learners who regularly accessed these outside the classroom, many students were observed enjoying completing gamified and relevant questions during class time. Gamified features such as points, stars, and bells, and a setup that encouraged repeated attempts at getting the correct answer appeared to be popular, as evidenced by participant comments. One student highlighted the stars and bells, saying that it felt "*kind of like I'm playing a game, so it makes you a lot of fun…*" (student 5). Another student expressed similar sentiments, commenting that "*you will try to finish it, if you're correct, you will feel very, uhm… maybe you, you'll feel great, and if you just… answer it wrong, and it will show the correct answer so that you will make you a deeper… just remember that, so I think it's very interesting*" (student 11).

The opportunity to complete H5P videos during class time in collaboration with peers was also mentioned as improving understanding and usefulness, as well as making the experience more fun, and "*maybe it's a little bit break for us, and we will feel better*" (student 1). Others mentioned appreciating videos that were relevant to their assessments and other studies, but non-academic topics were also liked and considered useful or as *"…some, some interesting topic, like it's not related to academic…"* (student 1).

" I like those stars most, so if you got a question right, then you got a star, right? It is kind of like I'm playing a game, so it makes you a lot of fun…"

– student 5

" …and just, when you see the video, some questions will be just, shown in it, and you will try to finish it, if you're correct, you will feel very, uhm… maybe you, you'll feel great, and if you just… answer it wrong, and it will show the correct answer so that you will make you a deeper… just remember that, so I think it's very interesting."

– student 11

"Tell the truth, I think no one will look it in advance, especially a few person who really like EAP, like sometimes the EAP is a little bit longer for us, I'm afraid of saying this, but it's sometimes really long, and if you put it during the class, maybe it's a little bit break for us and we will feel better."

– Student 1

Performance in formative assessments

Frequent engagement with interactive H5P videos was positively correlated with improved performance on formative in-class tests, and this association was further examined in panel interviews. Preparations for formative assessments included limited note-taking and the use of metacognitive learning strategies, such as discussing videos with peers, replaying or reviewing segments, and memorising key words or concepts. Videos were primarily used as a review tool and were often referred to during and after EAP classes as needed. When these were directly relevant to one or more assessments, such as finding sources, preparing

for a tutorial, or engaging with feedback, students tended to use H5P videos more frequently. This suggests predominantly extrinsic and assessment-oriented usage of interactive videos.

Learning strategies

Acquiring and conscientiously applying relevant learning strategies is widely considered important for successful learning (e.g., Wong & Nunan, 2011). Students were therefore asked how they responded to interactive H5P videos, to what extent they took notes while completing them, and how they generally experienced using the videos. Depending on how they understood the purpose of the H5P videos, various metacognitive study skills were applied, with student 1 noting that "*… I think those, those kinds of information [from the video] is useful to write down…*" and other students highlighting video outlines and key points as being useful to note. Other students predominantly memorised content, with one participant explaining that "*I would probably just take the link and remember what this page and maybe I can find some help in this page, that's all I did, I didn't take notes...*" (student 5). Finally, some students mentioned that they would "*[…] treat the video as a listening test, but I found it a little difficult for me*" (student 10) and would "*not listen again, I would just look the correct answer and try a new website and… put it*", trying different answers until they arrived at an acceptable response (student 12). Indeed, most participants appeared to focus on memorising and rewatching videos to improve their understanding.

> *"I think the core information you have listed in the slides, right? I remember… I think those, those kinds of information is useful to write down…"*
>
> **– Student 1**

“To be honest, I, I seldom take notes, but I must… I must admit that when I got some… it, it shows some links in the video, right? I would probably just take the link and remember what this page and maybe I can find some help in this page, that’s all I did, I didn't take notes...”

– student 5

“Because uh… I will listen this part and do this question… but if I'm wrong, I would not listen again, I would just look the correct answer and try a new website and… put it”

Student 12

Relevance

The importance and relevance of the videos to learners is another key aspect that relates to how students respond to and use H5P videos to improve their comprehension and retention. While the skills-based videos received positive feedback, most respondents considered a topic-based video on Alan Turing less useful, commenting that *“it’s not relevant to our courses”* (student 9) and *“it just depends on the interests of students and […] if they are just interested in it”* (student 11). By contrast, videos that explicitly prepared students for in-class tasks and speaking assessments or that reinforced academic skills, such as finding sources, were popular with most participants. One example of this was in a video preparing students for a test on academic integrity, where a student commented that *“[the most useful video] must be the reporting verbs, so and… it's just helped me to deeper understand the-, how to use those verbs in the reporting, just… in the reports, and…*” (student 11). As a result of finding the videos relevant and interesting, students appeared to spend more time on task both within and outside the classroom.

"Turing machine… It's not relevant to our courses… [asked for elaboration] A little more…? It can't prove, it can teach us, teach us something, uh… about how to get more scores in the EAP, and… just like a story."

– Student 9

"I, I agree with his points, and… I think that also that the Alan Turing will be the less useful for, for this, because… this topic is is out of the report, report verb, report verb, and it just depends on the interests of students and how they how they feel interest of it and if they are just interested in it, they will… try to just understand it more but for those students who just did not like it, they, they may think just don't understand and don't like it, so I think it will be the, maybe they're less useful…"

– Student 11

"[The most useful video] I think that must be the reporting verbs, so and… it's just helped me to deeper understand the-, how to use those verbs in the reporting, just… in the reports, and… it teach me that how to write those all those names and how to use them in the-, at the first of the sentence or the end of sentence; it's really, just helped me."

– **Student 11**

Discussion

The study investigated the effectiveness of interactive H5P videos for improving student engagement and academic performance within and beyond the EAP classroom. Quantitative data showed a moderate positive correlation between the frequency of access to interactive H5P videos and performance on in-class tests, and qualitative data indicated increased

cognitive, behavioural, and affective engagement, with high degrees of satisfaction. Many students also reported that videos improved their understanding and retention of academic skills, such as evaluating academic sources and using reporting verbs. In particular, the successful application of learning strategies appears to have facilitated active and student-centred learning, resulting in improved learning outcomes.

Considering these findings, interactive H5P videos might be used to scaffold and support active learning on blended English for Academic Purposes (EAP) courses. Such videos might also be more motivating and accessible than traditional face-to-face delivery, while dual visual and auditory information channels may better support cognitive load and encourage deep learning (Noetel et al., 2021; Tugtekin & Dursun, 2022). Further drawing on cognitive load theory, interactive videos could reduce redundant or extraneous processing by highlighting key terms and by managing or removing non-essential graphics and words (Mayer, 2021). In the context of AI use, interactive videos could provide learners with accessible, explicit instructional guidance that may facilitate effective prompting and the application of results to academic writing and presentations (Kirschner & Hendrick, 2020). Extended to other interactive technologies such as Virtual Reality, Augmented Reality, and educational games, interactive activities can further provide opportunities for learner participation and cognitive engagement, thereby increasing knowledge retention and motivation (Guaña-Moya et al., 2024). Such engagement is also likely to lead to more meaningful learning by facilitating deeper, more active learning in collaboration with peers and improving learning outcomes.

However, learners should not be left to their own devices, and it is necessary to ensure that students receive sufficient technical and social support to prepare them to apply appropriate

learning strategies and self-regulation when using interactive videos independently. Digital tools can facilitate effective communication and enable new relationships and ways of thinking, but they also impose constraints on other ways of thinking and being (Jones & Hafner, 2021). An understanding of these affordances and constraints is therefore essential for effective blended learning with interactive videos. While stronger students were particularly interested in engaging with interactive H5P videos outside the classroom, most were not yet ready to manage their time and apply learning strategies without teacher support. The lack of readiness may partly be attributed to previously documented readiness gaps in autonomous learning (e.g., Lin and Reinders, 2018), but there is also a need for explicit instruction and collaborative practice to help students use H5P videos and other digital tools, such as generative AI, effectively for learning. When interactive H5P videos are used with AI tools such as ChatGPT, scaffolded support can facilitate more engaging and autonomous learning while maintaining motivation and digital and AI literacies (Zou et al., 2025), thereby preparing learners for responsible and ethical practice and communication (Jones & Hafner, 2021).

For institutional implementation to be successful, teacher training to help realise the pedagogical affordances and technical requirements of digital tools is also essential (Stockwell & Reinders, 2019). This is particularly important for students with limited experience of self-regulated language learning, highlighting the need for scaffolded training and explicit teacher instruction (Yang et al., 2025). Indeed, Ma and Lee (2021) emphasise the importance of supporting students in developing self-regulation and digital literacy skills in blended learning environments by providing them with training in the effective use of digital tools, such as H5P activities. Students also mentioned that they do not frequently access videos outside class due to limited time-management and self-regulation skills. For instance,

few students took notes, and the majority struggled to apply the skills from the videos to their studies, with most interaction occurring with peers in the classroom. As a result, a flipped model, while popular with some participating students, would likely be limited by insufficient experience of engagement outside the classroom.

Student engagement and participation are also highly sensitive to contextual factors and to the integration of digital activities into the curriculum (Boulton et al., 2018). While frequent use of digital activities is associated with improved performance, the reverse is not necessarily true, as study skills and conscientiousness also play important roles in determining effectiveness (*ibid*.; Wong & Nunan, 2011). However, successful integration of H5P videos within the EAP curriculum, where teachers can readily provide scaffolding, feedback, and affective support, could go some way toward resolving the identified issues. Jacob and Centofanti (2023) emphasise how such teacher-student interactions might improve performance, and Stockwell and Reinders (2019) highlighted how the use of digital tools coupled with appropriate scaffolding and teacher support can enhance the effectiveness of blended learning. The teaching of metacognitive strategies such as time management, note-taking, and collaboration in the completion of digital activities could also allow for increased flexibility when used outside the classroom (e.g., Wong and Nunan, 2011; Brewer & Movahedazarhouligh, 2018). In turn, this may improve study efficiency and self-regulated learning with sufficient practice.

Further improving the learning experience by gamifying H5P activities with clear leaderboards and badges may further increase learner engagement by providing clearer, more relevant learning goals (Huang & Hew, 2015). A few students mentioned enjoying the bells, stars, and points provided by H5P videos, and it is suggested that gamification could be

enhanced by linking scores from completed H5P videos to a leaderboard accessible to all students and teachers on the module. Extensive literature reviews have found that learning outcomes can be improved by facilitating such interaction and gamification (Lai & Bower, 2019). Finally, learner autonomy and engagement have been linked to increased motivation (Stockwell & Reinders, 2019; Dörnyei & Ushioda, 2011), and greater gamification could increase the adoption of H5P videos when paired with training in explicit learning strategies.

Conclusion

The findings of this study contribute to an understanding of the affordances and limitations of blended learning with interactive H5P activities. While these could facilitate student engagement and improve retention, social and pedagogical support is necessary to ensure their success. As such, opportunities to engage with interactive H5P videos in social settings should be provided, whether in the classroom, during designated self-study periods, or as part of group studies, allowing students to collaborate and co-construct meaning with other learners (Garrison, 2017). This is particularly important for students new to the academy, who frequently lack sufficient self-regulation and time-management skills needed to manage their studies effectively (Yang et al, 2025).

Given the need for flexible approaches that combine the strengths of online and face-to-face provision (Graham, 2019), a blended learning model that includes interactive H5P video content could effectively scaffold and support diverse learning needs on an EAP course. As evidenced by real-world use cases, such videos could serve a range of purposes, including providing explicit instruction on key skills, improving listening comprehension, and

reinforcing or reviewing learning, thereby contributing to knowledge retention. This would likely work best when students have both the time and space to engage with videos, whether within or beyond the classroom, and in collaboration with their peers. To ensure that this translates into improved academic performance in an EAP course, interactive activities should also be thoughtfully integrated into the curriculum and supported by relevant and needs-based academic and technical skills training (Noetel et al., 2021).

Given the correlational design, the direction of the relationship between the frequency of H5P video access and performance on formative assessments could not be established. For instance, it is possible that higher-proficiency students engaged more frequently with videos and outperformed their peers independently. Participant mortality may also have affected the findings, as most of the 107 participants did not engage with the videos beyond the first few weeks. It was not possible to differentiate by demographic group because the analysis relied on Moodle analytics data for quantitative results. As a result, while the findings highlight the possibilities afforded by H5Ps in an EAP curriculum, it has not been established whether frequent completion of H5P videos explicitly leads to increases in engagement and performance.

Future studies could aim to confirm a causal relationship between the frequency and duration of interactive H5P activity use, including H5P videos, and improvements in academic performance and achievement. Observations of students engaging with the H5P materials in real-time, for example, data showing the dynamics when students collaborated on the videos together, would also be considered a useful direction for future research. Finally, considering the variety of perspectives and approaches to H5P video use expressed by participants in the panel interviews, it would be useful to analyse the relationship(s)

between language proficiency, gender, and self-regulated H5P video engagement. Based on initial findings, higher-proficiency students and males were more likely to engage with the videos, but the reasons for this observation remain unclear.

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Appendix 1: screenshots from a sample H5P video

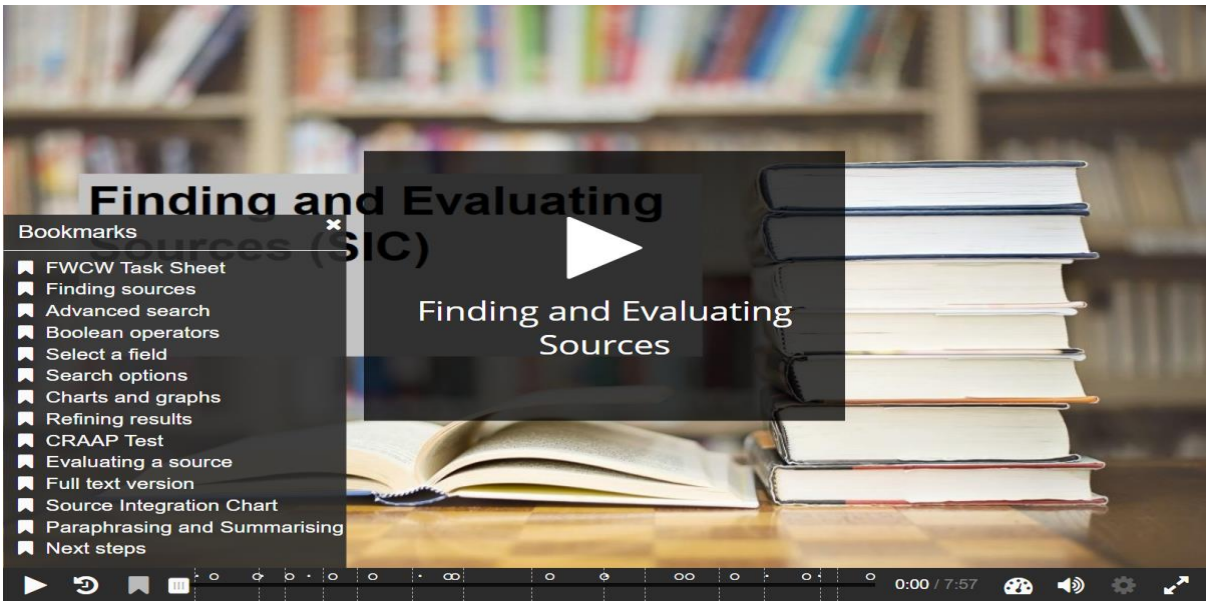


Image 1: first page from an H5P video on finding and evaluating academic sources. Bookmarks have been included to facilitate navigation, with each dot on the timeline representing an interactive element such as a link, multiple-choice, true-false, or drag-and-drop question.

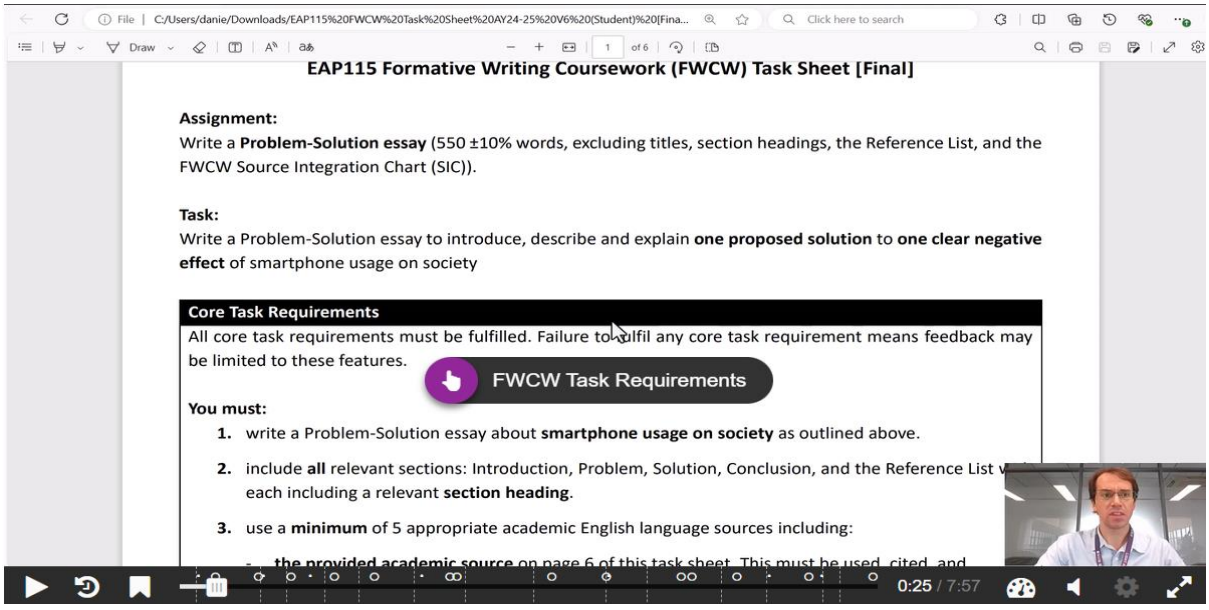
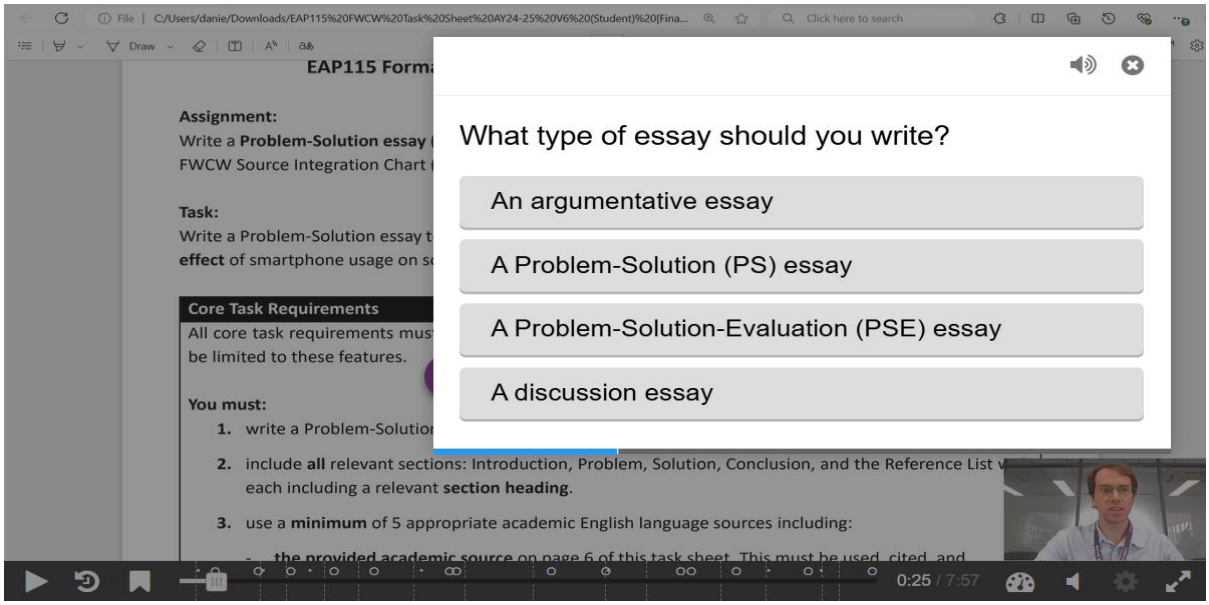


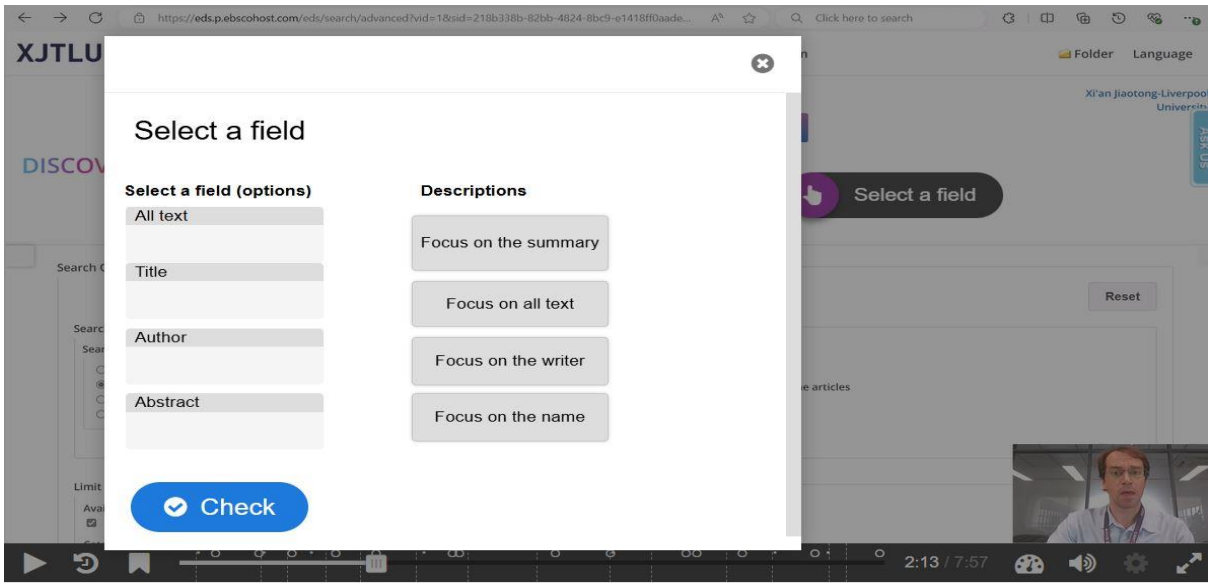
Image 2: Screenshot of a screencast of the writing coursework task sheet with a clickable interaction. A talking head is included in the bottom-right corner, explaining key concepts and skills before and after the interaction.



945

946 Image 3: a sample multiple-choice question on the writing coursework task sheet (in the

947 background) with immediate feedback and a summary provided to reinforce learning.



948

949 Image 4: a sample drag-and-drop question to assess understanding of library refinement

950 criteria with immediate feedback provided to reinforce learning.

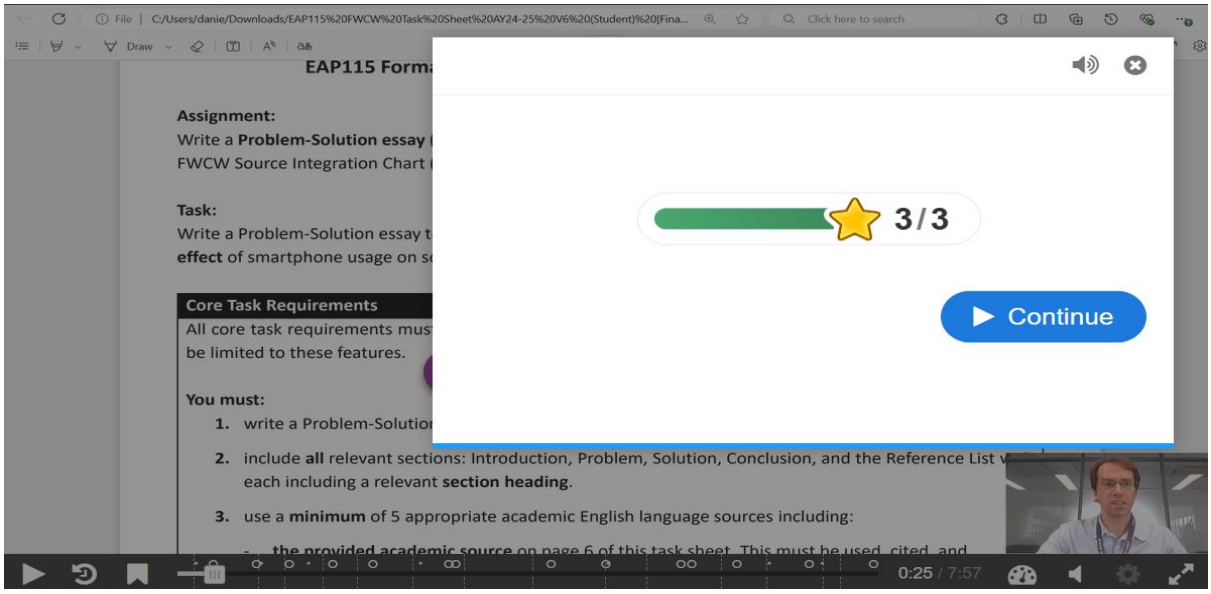


Image 5: gamified points, stars, and bells encourage affective engagement with the learning and are displayed after each completed interaction. If any question(s) are answered incorrectly, options to replay will be provided next to the 'continue' button.