

Supporting learner autonomy through interactive H5P content: evidence from an EMI vocational higher education context

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Article Info

Article history:

Received Mar 29, 2026

Revised Aug 13, 2026

Accepted Aug 20, 2026

Keywords:

Autonomous learning
English medium instruction
English-language learning
H5P interactive content
Self-access learning
Vocational higher education

ABSTRACT

The integration of interactive digital content has become increasingly important in supporting autonomous learning in higher education, particularly in vocational contexts where practical language competence is essential. This study aims to examine the role of interactive H5P (HTML5 package)-based content embedded in a learning management system (LMS) in supporting autonomous English learning among students enrolled in an international class at a vocational higher education institution in Indonesia. Employing a qualitative-dominant mixed-method approach, data were collected through student questionnaires, reflective feedback, and observations of learning activities within the online learning environment. The findings indicate that H5P interactive content effectively supports learner autonomy by enabling self-paced learning, providing immediate feedback, and increasing student engagement in independent English practice. Quantitative results show a high level of student satisfaction, with a mean score of 4.23, indicating that learners perceived the materials as accessible, motivating, and aligned with their individual learning needs. However, challenges related to technical familiarity and varying levels of learner readiness were also identified. This study provides empirical evidence that H5P-based interactive content enhances learner autonomy through measurable engagement and repeated task interaction.

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1. INTRODUCTION

The increasing demand for English language competence in higher education has positioned English not only as an academic subject but also as a critical professional skill, particularly in vocational higher education. In international and industry-oriented programs, students are expected to demonstrate functional English proficiency to support academic mobility and workplace communication. However, vocational students frequently encounter challenges in achieving this competence due to limited exposure to English, diverse proficiency levels, and constrained classroom time. As a result, learning models that emphasize learner independence and flexibility have gained increasing attention as strategic responses to these challenges [1].

One approach that addresses these issues is learner autonomy, which refers to learners' ability to take responsibility for planning, monitoring, and evaluating their own learning processes [2]. In language education, autonomy does not imply learning in isolation, but rather independence developed through reflection, social interaction, and pedagogical support [3]. Curriculum designs that integrate autonomy-supportive tasks enable learners to gain greater control over their learning processes [4]. The relevance of

learner autonomy is particularly significant in the Indonesian higher education context, where learning traditions have historically emphasized teacher guidance and structured instruction. Research on learner autonomy in Indonesian English as a foreign language (EFL) settings indicates that many students are accustomed to teacher-centered learning environments in which instructors play a central role in directing learning activities [5], [6]. This tendency is often associated with sociocultural factors, such as strong respect for teacher authority and educational experiences that prioritize compliance with instructional guidance over independent learning. Consequently, although autonomy is widely promoted as an important competence in tertiary education, Indonesian students may initially demonstrate limited readiness for self-directed learning and often require structured support to gradually develop autonomous learning behaviors [7], [8].

This situation is also relevant in vocational higher education institutions, such as polytechnics, where learning is often organized through structured, guided instruction to ensure that students acquire the practical competencies required in professional contexts [9]. While such approaches effectively support skill development, students in tertiary education are also expected to gradually develop greater independence in managing their learning. This expectation is particularly important in language learning, which requires continuous practice and learner engagement beyond classroom instruction [7], [10].

Self-access learning (SAL) is a practical extension of learner autonomy, providing learners with resources and activities that enable them to manage their learning according to their individual needs and goals [11], [12]. With the digitalization of education, learning management systems (LMS) have increasingly functioned as SAL environments that support flexible access, self-paced progression, and opportunities for reflection and interaction [13], [14]. Research demonstrates that LMS-based SAL is most effective when designed with autonomy-supportive principles rather than functioning solely as content delivery platforms [15]. However, many self-access materials remain passive, relying heavily on static texts or non-interactive videos, which may limit learner engagement and meaningful practice [16].

Digital learning technologies have increasingly been utilized to create more student-centered learning environments. Interactive learning tools not only facilitate learning activities but also encourage students to participate actively in assessment and knowledge construction [17]. Recent developments in interactive digital content offer new opportunities to address these limitations. H5P (HTML5 Package) is an open-source platform that enables the creation of interactive learning materials, such as quizzes, interactive videos, and feedback-driven activities, which can be directly integrated into LMS environments [18]. Literature highlights H5P's flexibility, cross-device compatibility, and capacity to support activity-based and learner-centered learning [19], [20]. By allowing learners to control the pace of learning, revisit materials, and receive immediate feedback, H5P aligns closely with the principles of learner autonomy and self-regulated learning (SRL) [21]. Empirical studies in higher education have reported that H5P-based interactive content can enhance student engagement, attention, and conceptual understanding compared to conventional digital materials [18], [19], [22]. Further research emphasizes its role in promoting SRL and positive learner perceptions of LMS-based self-paced instruction, particularly in asynchronous language learning contexts [21], [23], [24]. H5P modalities, particularly interactive videos and course presentations, support SRL by enabling learners to assess understanding through embedded quizzes and immediate feedback, enhancing engagement, comprehension, and reflection [20], [25]. Additionally, multimedia-rich course presentations promote active engagement and structured learning, supporting key SRL processes such as planning, time management, and monitoring [25].

Previous studies have demonstrated the potential of H5P interactive content to enhance engagement and support active learning in LMS-based environments; however, several gaps remain [19], [26], [27]. Existing research largely relies on self-reported perceptions and general learning outcomes, with limited use of learning analytics to capture learners' actual interaction patterns [28]. In addition, learner autonomy in digital language learning is often examined as a psychological construct, such as motivation or perceived independence, while observable autonomous behaviors in online environments remain underexplored [29]–[31]. This limitation is particularly evident in English-medium instruction (EMI) in vocational higher education, where empirical studies on H5P integration remain uncommon. Despite the increasing need for autonomous English learning.

Despite the increasing implementation of EMI in vocational higher education, a critical challenge persists: limited learner autonomy, which may be characterized as a “learner autonomy crisis” in EMI contexts. While EMI environments require students to actively engage with content, manage their learning, and use English as a medium for knowledge construction, many learners remain dependent on teacher-directed instruction and demonstrate insufficient SRL behaviors [32]. This issue is influenced by factors such as limited preparation for EMI, teacher-centered learning cultures, low English proficiency, unfamiliar concepts delivered in English and gaps between students' motivation and their ability to apply effective learning strategies [33]–[36]. In response to these gaps, this study adopts an evaluation-based approach to examine how learners interact with H5P content by integrating learner perceptions with LMS-based learning analytics, thereby providing a more comprehensive understanding of engagement and collaborative problem

solving from both experiential and behavioral perspectives [37]. Focusing on an EMI vocational higher education context, the study offers empirical and practical insights into the design of H5P-based SAL environments that support autonomous English learning.

2. RESEARCH METHOD

This study adopted an evaluation research design to examine how interactive H5P-based SAL materials supported autonomous English learning in a vocational higher education context. Rather than conducting an experimental comparison, the study focused on evaluating an instructional practice already embedded in regular teaching activities, with attention to learning processes, learner experiences, and contextual implementation [38], [39]. This design is appropriate for understanding the educational value of digital learning interventions in authentic educational settings [40]. Although the sample size ($n=32$) is relatively small, it is appropriate for this qualitatively dominant evaluation study, which focuses on in-depth, rich exploration of the data rather than numerical generalization. The homogeneous EMI class context and direct engagement with H5P materials support the adequacy of the sample for identifying meaningful patterns in learner autonomy and engagement. Quantitative descriptive data were obtained from questionnaires and learning analytics to complement and contextualize these findings [41].

The research was conducted at a public vocational higher education institution in Indonesia that offers English as a Medium of Instruction programs, in which English serves as both a subject of study and a medium for academic and professional development. Participants consisted of 32 students enrolled in the EMI International class across seven departments in science and social science majors. The research subject is also shown in Table 1.

Table 1 Research subject demography

Aspect	Detail	Score
Gender	Male	12
	Female	20
Major	Social science	25
	Science	7
Nationality	Indonesian	22
	South Sudanese	9
	Malagasy	1

Although the number of participants was relatively small, the study aimed to explore learning experiences within a specific EMI vocational class context rather than generalizing findings to broader populations. Students enrolling in a single EMI class where the H5P materials were used participated in the study. The participant pool was restricted to students who finished the learning exercises and questionnaire because the intervention was carried out within a single course offering. The course was delivered through a blended learning environment supported by a LMS, within which interactive H5P-based self-access materials were integrated to promote independent engagement and learner responsibility beyond classroom activities [42]. Participants were students enrolled in an international class during the implementation of the H5P-based SAL materials. The participant group reflected the diversity typical of vocational education, including varied academic backgrounds and differing levels of English proficiency. Participation was voluntary, ethical considerations were observed throughout the research process and confidentiality and anonymity were ensured by reporting all data in aggregate form [43]. The learning materials evaluated consisted of online self-access English content developed with H5P and embedded in the institution's LMS. The material consists of two modules, vocabulary and grammar, which are represented in Figures 1 and 2.

These materials were designed to support autonomous learning by allowing students to control the pace, sequence, and frequency of learning activities [44]. Table 2 shows the details of the book. As shown in Table 2, both modules were designed using a structured sequence consisting of introductory, preparatory, and practice-based activities. The integration of various H5P content types enabled learners. This structured design supports SAL by enabling learners to progress through the materials at their own pace while receiving immediate feedback.

The H5P content included interactive quizzes, short instructional videos with embedded questions, automated feedback tasks, and practice exercises targeting vocabulary, grammar, and reading comprehension. Immediate feedback was a central feature, enabling students to monitor their understanding and adjust learning strategies without direct teacher intervention, thereby encouraging active engagement and self-regulation as key components of learner autonomy [45]. Data collection was conducted concurrently with the implementation of the H5P-based learning materials using multiple sources to ensure

a comprehensive evaluation of the learning process. A questionnaire was administered to capture students' perceptions of the interactive materials, focusing on accessibility, engagement, and support for independent learning [46]. Student opinions on H5P-based self-access vocabulary and grammar study materials were collected using a structured questionnaire. The 20 closed-ended items were scored on a four-point Likert scale from 1 (strongly disagree) to 4 (strongly agree). The questionnaire has five dimensions: content quality, usability and navigation, engagement and interactivity, learning outcomes, and overall satisfaction. Sample statements: *"The vocabulary and grammar topics are relevant to my academic and professional needs"*, *"The content is straightforward to navigate"*, *"The interactive components make learning more interesting"*, and *"I am satisfied with the overall experience of using this learning material."* Three open-ended questions were included to gather qualitative input on material strengths, weaknesses, and future growth suggestions.

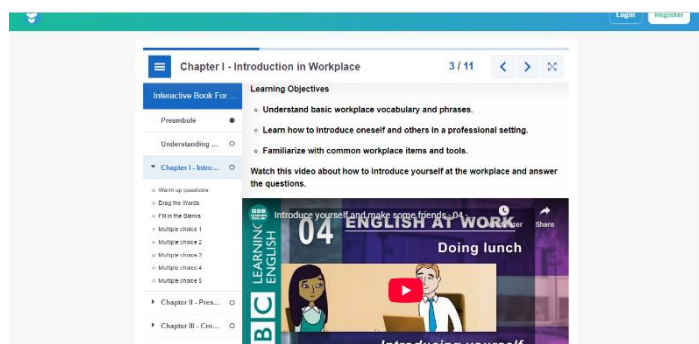


Figure 1. Vocabulary book

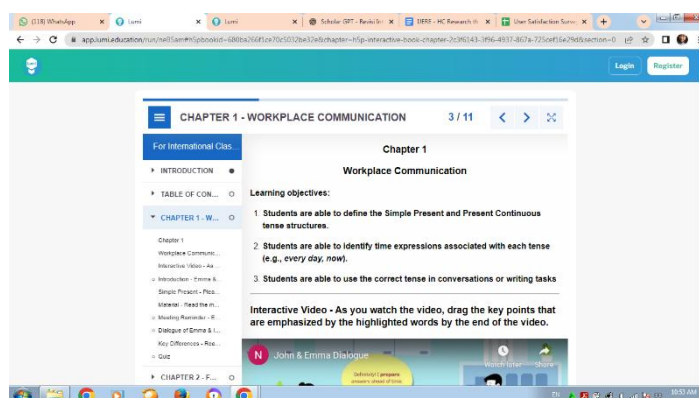


Figure 2. Grammar interactive book

Table 2. Structure of H5P-based self-access English learning materials

Module	Learning objectives	Topic	Page number	Description
Interactive vocabulary book	To develop students' vocabulary knowledge and contextual understanding	1. Introduction in workplace	10	Learning vocabulary through real-life topics; understanding word meaning in context; practicing vocabulary in communication; simple and interactive activities
		2. Presentation		
		3. Cross-cultural communication		
		4. Digital literacy		
		5. Negotiation		
		6. Small talk		
		7. Global business and economic		
		8. Leadership and teamwork		
Interactive grammar book	To enhance students' understanding of grammatical structures and usage	1. Workplace communication	10	Learning grammar through examples; practicing sentence structure; understanding how grammar is used; interactive exercises with feedback
		2. Famous person biography		
		3. Productivity in focus		
		4. Application letter		
		5. Daily life actions		
		6. How things work		
		7. Message comprehension		
		8. Your task and projects		

The questionnaire included both closed-ended items to generate descriptive data and open-ended items to allow reflective responses. In addition, students provided written reflections and participated in short interviews to offer deeper insights into their experiences of autonomous learning, interaction with the H5P materials, and perceived effects on motivation and learning behavior [47]. Learning activity records from the LMS were also examined to identify patterns of student engagement, including access frequency and activity completion, thereby providing contextual evidence to support students' self-reported experiences [47]. The questionnaire also captured students' English proficiency levels. The questionnaire found that students' English proficiency was generally at the intermediate level.

Qualitative data from open-ended questionnaire responses and student reflections were analyzed using thematic analysis following the approach proposed by Braun and Clarke [48]. The analysis began with open coding to identify recurring ideas related to learner autonomy, engagement, and perceived learning support, which were then organized into broader categories and developed into key themes representing the central findings of the study [49]. Quantitative descriptive data from questionnaires and LMS activity logs were analyzed to identify general trends in student participation and use of the learning materials. To enhance the credibility and trustworthiness of the findings, data triangulation was employed by comparing insights from different data sources [49], and member checking was conducted by sharing preliminary interpretations with selected participants to ensure that the findings accurately reflected their learning experiences [50]. Overall, this study employed a qualitative-dominant mixed-method evaluation design to examine the effectiveness of H5P-based self-access materials in fostering learner autonomy within an EMI vocational context. Data were collected from questionnaires, reflections, interviews, and LMS analytics to capture both perceptions and learning behaviors. Qualitative data were analyzed thematically to identify key patterns, while quantitative descriptive data supported the interpretation of findings. Triangulation across data sources was applied to enhance the study's validity and rigor. A relatively small sample size, reliance on students' self-reported perceptions, and a brief intervention period are among the numerous limitations of this study. Additionally, the findings' generalizability is restricted by the absence of a comparison group, necessitating a cautious interpretation.

3. RESULTS

3.1. Students' engagement with H5P content

Analysis of LMS activity logs, questionnaires, and student reflections indicates a high level of student engagement with interactive H5P content. Engagement was evidenced not only by frequent access to quizzes and interactive videos but also by repeated access to interactive activities and sustained participation across learning modules, suggesting active involvement in SAL. The presence of immediate feedback encouraged learners to reattempt tasks and independently explore materials, indicating engagement beyond passive content consumption. In this context, engagement can be understood not only as participation but also as an indicator of learners' active involvement in regulating their learning processes within interactive environments. The aspects of user satisfaction are displayed in Table 3.

As shown in Table 3, students reported very high satisfaction with the variety of learning materials ($M=4.44$) and interactive elements that support engagement ($M=4.23$). These results are consistent with empirical findings showing that content diversity and interactivity significantly enhance engagement in online and blended language learning environments. The perception that the platform was more engaging than traditional methods ($M=3.95$) further support the argument that interactive H5P content offers added pedagogical value compared to static LMS materials. These positive perceptions are consistent with the observed activity patterns in the LMS logs, suggesting that students' perceived engagement is reflected in their actual interaction behavior within the platform.

Table 3. Average user satisfaction scores for H5P digital material (engagement-related aspects)

Aspect evaluated	Mean score	Interpretation
Variety of learning materials (videos, and quizzes)	4.44	Very satisfied
Interactive elements support engagement	4.23	Very satisfied
The platform is more engaging than traditional methods	3.95	Moderately satisfied

3.2. Support for autonomous learning

The findings indicate that interactive H5P-based self-access materials effectively supported autonomous English learning by enabling students to exercise meaningful control over their learning processes. LMS activity logs demonstrate that students actively revisited materials, selected preferred activity types, and engaged in repeated practice, reflecting self-paced, SRL. These patterns suggest that learners

manage their study time and learning sequences according to individual readiness and priorities, which is a defining feature of learner autonomy in vocational higher education, as one student noted:

“Video and drag-down features, because it was easy to understand them.” (Rachel)

Beyond students’ perceptions, behavioral evidence from LMS logs provides a stronger evaluative basis for interpreting autonomy. Analysis of access data shows that learner interactions were concentrated in interactive, practice-oriented H5P activities rather than static page-based content. Although individual activity categories accounted for less than 10% of total LMS interactions, such proportions are considered substantial in digital learning environments, where learner engagement typically follows a dispersed or long-tail distribution. Consistent access rates above 5%, therefore, indicate deliberate learner preference rather than incidental or compulsory interaction. It is supported by LMS activity log data, as shown in Table 4.

Table 4. Frequency of student interaction with H5P activities

Rank	Content type	Frequency of occurrence
1	Fill in the blanks	536
2	Drag the words	466
3	Warm-up activity	413
4	Dialogue cards	396
5	Multiple choice	290
6	Question set	236

Note: Percentages are calculated from total LMS access records (N=3,329)

LMS activity log data indicate high levels of interaction across various H5P activity types. Practice-based activities such as “drag the words” (304 occurrences), “multiple choice” (291), and “fill in the blanks” (273) were among the most frequently accessed, alongside preparatory materials such as “list of vocabularies” (298) and “warm-up” modules (207). This pattern suggests that students actively engaged with both cores learning tasks and supporting materials, indicating a structured approach to SAL.

While access frequency reflects learners’ interest and exploratory behavior, task completion represents a stronger indicator of persistence and self-regulation. In self-directed learning research, completion data are widely regarded as evidence of learners’ effort investment and strategic engagement [51]. Table 5 presents the distribution of the most completed H5P content. Further evidence from user activity logs indicates variation in individual engagement levels, with some students demonstrating very high levels of interaction. Table 6 shows the distribution of student activity levels.

Table 5. Most completed H5P content

Rank	Content type	% of total accesses
1	Warm up	18
2	Drag the words	11.8
3	Fill in the blanks	11
4	Pre-activity	6.7
5	Multiple choice	6.5
6	Dialogue cards	6.3
7	Question set	4.8
8	Introduction	3.6

Note: percentages are calculated from total task completion records (N=516).

Table 6. Distribution of student activity levels (N=20)

Category	Activity range	Percentage (%)
High engagement	>270	20
Moderate engagement	150–270	75
Low engagement	<150	5

Table 6 presents the distribution of student activity levels based on LMS interaction data. The majority of students (75%) demonstrated moderate but consistent engagement, with activity levels ranging between 150 and 270 recorded interactions. A smaller group of students (20%) exhibited very high engagement, exceeding 270 activities, while only one student (5%) showed relatively low participation. This distribution indicates that most learners were consistently engaged with the H5P content, while a subset of students demonstrated intensive interaction with the learning materials. Rather than reflecting inconsistency,

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this variation suggests differentiated engagement patterns in which learners regulate the frequency and intensity of their interactions based on individual learning needs. Such patterns are characteristic of self-directed learning environments, in which learners are not expected to engage uniformly but instead exercise control over their learning processes. This supports the interpretation that the use of H5P within the LMS facilitates flexible and autonomous learning behaviors among students.

3.3. Perceived impact on English learning

Participants reported a perceived improvement in vocabulary and understanding of grammar through repeated interaction with H5P-based exercises. Interactive activities such as drag-and-drop tasks, fill-in-the-blank exercises, and contextual practice encouraged active engagement with language forms. Several students indicated that the combination of explanations, examples, and practice tasks helped them better understand grammatical structures and vocabulary usage. For example, several students stated that:

“The exercises and easy explanations helped me understand better.” (Dian)

“Clear explanations and real-life examples helped me understand the concepts better and apply them in practical situations.” (Miko)

Students also reported that immediate feedback during interactive activities enabled them to identify mistakes and revise their answers directly. This enabled them to perform self-correction and continue the tasks independently. In addition, participants indicated increased confidence in using English after engaging with contextualized vocabulary and grammar activities. Several students reported that repeated exposure to these activities helped them remember language forms and apply them in practical situations. One participant explained that:

“Both exercises for grammar and vocabulary require understanding the meaning of words within specific contexts, which is highly effective for vocabulary acquisition and comprehension.” (Septi)

Findings further show that multimedia elements in H5P supported sustained engagement during learning activities. The integration of visual, textual, and interactive elements helped students process language input while remaining engaged with the tasks. Students also reported increased motivation to engage with the learning materials due to multimedia and interactive features. Videos, visual explanations, and interactive quizzes were frequently mentioned as helpful in maintaining attention during independent study. One participant stated that:

“The video materials are very engaging and beneficial, as the explanations are easier to understand and don’t feel as rigid as reading plain text.” (Diana)

3.4. Challenges in implementation

Despite positive engagement with the H5P-based learning materials, students also articulated several challenges during their interaction with the platform. Technical and usability issues emerged as one of the most common concerns. Some learners reported difficulties navigating the learning interface, particularly when completing multiple activities within a single page. For instance, one participant mentioned that:

“Perhaps do better for navigation since I had to scroll up and down many times and it was tiring.” (Tian)

Several students also reported technical issues related to interactive components, particularly drag-and-drop activities. While such features were designed to enhance interactivity, some respondents indicated that they occasionally disrupted the learning flow. One student commented that:

“Sometimes, when I want to drag the answer, it doesn’t work well.” (Anton)

The statement indicating that minor technical inconsistencies could create frustration during task completion. These findings illustrate that although interactive tools can support engagement, technical reliability remains essential to ensure a smooth learning experience.

Another challenge involved the clarity of instructions and task guidance within the learning materials. Some participants noted that certain activities, particularly fill-in-the-blank tasks, required clearer instructions to avoid confusion. One respondent suggested that:

“The clear explanation or instruction for the box section and the answer in the ‘fill in the blank’ section should be more clear.” (Hari)

The feedback highlights the importance of instructional clarity when designing self-access digital learning activities. Without sufficient scaffolding or guidance, learners may struggle to interpret task requirements independently. In addition to usability concerns, students also reported challenges related to content organization and cognitive load. A few respondents suggested that presenting multiple topics within a single section could lead to confusion. For example, one participant recommended:

“Maybe create a more specialized section in which we learn only one material every chapter.” (Devi)

Similarly, another student noted that although drag-and-drop activities were engaging, using them too frequently could become tiring during extended learning sessions. These responses indicate that balancing interactivity with cognitive load is an important consideration when designing digital learning materials.

4. DISCUSSION

4.1. Students’ engagement with H5P content

Rather than merely increasing participation, engagement appears to function as a transitional mechanism through which students move from teacher dependence toward greater self-regulation. This is particularly significant in vocational EMI settings where learners often have limited prior experience with autonomous language learning [51], [52]. In language learning, such engagement is a key precursor to learner autonomy, reflecting learners’ willingness to invest effort and take responsibility for their learning [53].

From an evaluative perspective, these findings suggest that interactive H5P content effectively fosters engagement in vocational higher education. Engagement functions not only as a behavioral outcome but also as a condition supporting autonomous English learning. Research indicates that cognitively and behaviorally engaged learners are more likely to initiate self-directed actions, such as revisiting materials and monitoring progress [53], [54]. The observed patterns, i.e., frequent access, repeated attempts, and positive perceptions, reflect these autonomy-supportive behaviors.

Additionally, immediate feedback within H5P activities supports engagement and persistence in self-access digital environments [55]. It helps learners identify gaps without direct teacher intervention, reinforcing independence. This is particularly valuable in vocational higher education, where students benefit from flexible, self-paced resources alongside practical skill development [56]. Overall, while interactive H5P content promotes engagement that supports autonomous learning, its effectiveness depends on the quality of instructional design and learners’ readiness for self-regulation [57]. The findings suggest that the feedback functions not only as a technical feature but as a critical psychological mechanism that supports the development of learner autonomy in EMI contexts.

In line with SRL theory, immediate feedback enables learners to monitor their understanding, evaluate performance, and adjust learning strategies in real time, thereby operationalizing the processes of planning, monitoring, and self-evaluation that define autonomous learning [2], [21]. This is particularly important in vocational EMI settings, where students often transition from teacher-centered learning cultures and may lack readiness for independent learning [5]–[7]. From a motivational perspective, this feedback reinforces learners’ sense of competence and control over their learning, which are essential for sustaining intrinsic motivation in self-access environments [3].

Moreover, the ability to instantly retry tasks turns errors into iterative learning opportunities, fostering persistence and reducing the anxiety often associated with language learning in EMI settings. This aligns with prior research highlighting the role of interactive H5P activities in promoting reflective and self-paced learning through feedback-driven engagement [21], [23]. Therefore, immediate feedback can be understood as a key mechanism through which interactive digital environments address the broader “learner autonomy crisis” by bridging the gap between learners’ need for guidance and the expectation of self-directed learning in EMI vocational education. Interactive H5P content fosters high student engagement and serves as a psychological mechanism for developing learner autonomy by providing immediate feedback and pedagogical scaffolding. These digital tools support SRL in vocational environments, helping students transition from teacher-centered models to independent, self-paced skill development.

4.2. Support for autonomous learning

Tables 3–5 demonstrate that interactive H5P activities achieved frequent access and meaningful completion rates (6–8%), reflecting sustained engagement rather than superficial interaction [8], [58]. Learners strategically prioritized warm-up, grammar, and vocabulary tasks to support incremental

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development, a finding corroborated by qualitative data. Students identified H5P interactive videos and drag-and-drop activities as the most helpful features, as reflected in one participant's comment. Interactive videos appear to support learning by combining explanations with embedded quizzes and immediate feedback, which help learners check their understanding and stay engaged, especially when dealing with more complex material [59]–[61]. They also give learners the flexibility to move at their own pace and revisit content when needed, encouraging a more self-directed approach to learning [61]. Similarly, drag-and-drop activities make learning more active by prompting learners to recall and apply knowledge in a hands-on manner, while instant feedback helps reinforce understanding [19], [62]. Taken together, these findings suggest that when learners are given the freedom to choose activities, control their pace, and persist through tasks, they are more likely to take ownership of their learning.

These patterns align with research identifying repeated engagement with interactive practice as a behavioral marker of learner autonomy [58]. By regulating their own pacing and persisting through tasks, students demonstrated SRL-independently managing cognitive strategies based on perceived difficulty [63]. In the Indonesian vocational context, this flexibility is essential given intensive practical workloads. Thus, these results provide empirical support for interactive H5P content as a vital tool for facilitating self-paced, independent engagement in LMS-based vocational education. Interactive H5P activities facilitate high engagement and SRL by providing a balance of pedagogical structure and learner flexibility, particularly through videos and drag-and-drop tasks. These tools empower students to manage their own pace and strategies, effectively bridging the gap between instructional guidance and independent autonomy in vocational education.

4.3. Perceived impact on English learning

Student reflections highlighted perceived improvements in vocabulary and grammar through repeated interaction with H5P activities. Participants noted that structured tasks, such as drag-and-drop and fill-in-the-blank exercises, encouraged active processing rather than passive consumption [64]. Such structured practice allows learners to engage with language forms within meaningful contexts, strengthening both comprehension and retention [65].

The immediate feedback embedded in H5P was a primary driver of independent learning. By allowing students to identify mistakes and revise their answers in real time, the platform promoted self-correction and deeper cognitive engagement [18]. This digital scaffolding enables learners to monitor their own performance and refine their understanding without constant instructor guidance [66]. Furthermore, the multimedia nature of H5P reduced the cognitive load typically associated with complex foreign language instruction by distributing processing across visual and textual channels [23]. As one student noted, video materials were “beneficial” and “do not feel as rigid as reading plain text,” echoing research that suggests multimodal tasks increase motivation and attention [67].

Interactivity and immediate feedback allow students to take control of their cognitive processes, a key component of autonomy in technology-supported environments. This is particularly valuable in EMI contexts, where students face the dual challenge of mastering academic content and language proficiency simultaneously [68]. By reducing dependence on instructor intervention, H5P supports the gradual development of independent problem-solving skills.

However, the transition to fully autonomous learning is mediated by technical stability and interface design. Consistent with previous research, usability and page organization significantly influence engagement [22], [69]. While digital environments offer opportunities for independence, learners with varying self-regulatory skills may struggle without intuitive navigation [63], [70]. In vocational education, where students balance academic study with intensive practical training, the accessibility and stability of digital tools are critical for sustaining learning outside the classroom [9]. Consequently, successful implementation requires a balance between high-quality pedagogical design and robust technical infrastructure to ensure the focus remains on material substance rather than operational hurdles. Interactive H5P activities improve language comprehension and autonomy by providing immediate feedback and multimodal scaffolding, which fosters active processing and self-correction. However, the successful transition to independent learning depends on balancing high-quality pedagogical design with a stable, intuitive technical infrastructure to maintain student engagement in demanding vocational settings.

4.4. Challenges in implementation

The challenges identified in this study show that the success of H5P-based learning is not only about making materials interactive, but also about how well the design supports students' learning experience. Technical issues such as difficult navigation and unstable drag-and-drop features can interrupt the learning process and reduce students' sense of control over their learning. This is particularly important in EMI vocational contexts, where students often come from teacher-centered backgrounds and are still developing

independent learning habits [5], [6]. When the system does not function smoothly, it can undermine students' confidence and make it harder to engage in self-directed learning, a key goal of learner autonomy [2]. While this study employed H5P interactive activities, previous research similarly reported that technology-mediated English communication increased learners' confidence and reduced their anxiety toward using English.

The findings also highlight the importance of clear instructions in SAL. Although autonomy encourages students to take responsibility for their learning, it does not mean they should learn without guidance. As emphasized in the literature, effective autonomous learning requires structured support, especially for students who are not yet fully ready to learn independently [3], [7]. When instructions are unclear, students may feel confused and spend more effort trying to understand the task rather than focusing on learning itself. This suggests that well-designed guidance remains essential, even in interactive and flexible learning environments.

In addition, students' feedback on content organization and cognitive load suggests that excessive interactivity can be overwhelming. While H5P is known to increase engagement through interactive and multimedia elements [18], [19], using too many activities or combining multiple topics in a single section can make learning feel tiring and unfocused. This aligns with the idea that effective digital learning should not only be engaging but also manageable, allowing students to process information step by step [16]. From a SRL perspective, students benefit more when learning materials are clearly structured and allow gradual progress rather than presenting too many elements at once [21]. Overall, these findings suggest that implementing H5P in EMI vocational education requires a careful balance between interactivity, clarity, and simplicity. Addressing these challenges is important not only to improve the learning experience but also to ensure that digital learning environments effectively support the development of learner autonomy, especially for students transitioning from teacher-dependent to more independent learning practices. The success of H5P-based learning depends on balancing interactivity with technical stability and providing clear instructions to prevent cognitive overload and frustration, especially for students transitioning from teacher-centered learning environments. These findings emphasize that robust pedagogical scaffolding and intuitive design are essential for building the confidence and self-regulatory habits necessary for sustainable learner autonomy.

5. CONCLUSION

This study examined how interactive H5P-based learning resources helped vocational higher education EMI students learn English independently. Results imply H5P interactive content aids autonomous learning. Students routinely completed interactive LMS activities, suggesting self-paced learning. Students reported improved vocabulary, grammar, English confidence, and independent study enjoyment after assignments. Interactive digital media increases learner autonomy and prepares students for self-directed involvement in global English-speaking professional environments, according to research. LMS interactive learning design promotes self-paced learning, active involvement, and structured freedom, contributing to digital language learning and learner autonomy research. Results demonstrate how instant feedback, frequent practice, and varied learning routes operationalize learner autonomy in H5P-based SAL environments. This study uses learning analytics data and students' perceived autonomy to understand autonomous language learning in digital environments in EMI vocational higher education. Effective education, timely feedback, and continuing interaction in digital learning settings foster student autonomy.

The study emphasizes rigorous H5P-based learning material instructional design in EMI situations. Clear learning instructions, balanced interactive elements, and institutional support-including technology infrastructure and instructional coaching- are needed for implementation. These boost student engagement and self-directed learning. Despite these benefits, there are drawbacks. The study only examined one vocational higher education institution, so it may not apply to other educational situations. Learner attitudes and engagement metrics trumped language proficiency development metrics. Thus, the outcomes should be regarded as evidence of student engagement, perceived autonomy, and self-directed learning rather than English language competency increases. The findings imply that H5P-based learning environments can promote autonomous learning and learner autonomy, but the lack of objective language achievement metrics limits the intervention's impact on language performance.

Future studies may examine the long-term effects of interactive digital learning tools on language development and learner autonomy using bigger, more varied samples, more institutional contexts, and longitudinal methodologies. To assess their adaptability, future research may replicate H5P-based SAL environments at vocational higher education institutions in Indonesia. To enhance language acquisition, researchers can also create and evaluate interactive speaking and listening modules. Future research may examine learning analytics, autonomous learning behaviors, and quantitative language performance outcomes in order to better understand interactive digital learning environments and enhance EMI vocational higher education digital learning models.

ACKNOWLEDGMENTS

The authors would like to sincerely thank all participants for their valuable contributions to this research.

FUNDING INFORMATION

This research was funded by the Government of Indonesia.

AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

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So : Software

Va : Validation

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CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author, [HC], upon reasonable request.

REFERENCES

- [1] A. W. E. Prastya, A. E. Cahyono, and N. M. Ulfa, "The Use of H5P Interactive Video as a Learning Medium to Improve Vocational High School Students' Learning Outcomes," *Teaching, Learning, and Development*, vol. 3, no. 2, pp. 125–131, Jul. 2025, doi: 10.62672/telad.v3i2.67.
- [2] M. Melvina and J. Julia, "Learner autonomy and English proficiency of Indonesian undergraduate students," *Cypriot Journal of Educational Sciences*, vol. 16, no. 2, pp. 803–818, Apr. 2021, doi: 10.18844/cjes.v16i2.5677.
- [3] D. Little, "Language learner autonomy: Rethinking language teaching," *Language Teaching*, vol. 55, no. 1, pp. 64–73, Jan. 2022, doi: 10.1017/S0261444820000488.
- [4] D. Sieglöva and L. Stejskalova, "Designing language courses for twenty-first century competences: a model of teaching toward learner autonomy implemented in a university context in the Czech Republic," *Language Learning in Higher Education*, vol. 11, no. 1, pp. 33–49, May 2021, doi: 10.1515/cercles-2021-2004.
- [5] N. S. Lengkanawati, "Learner autonomy in the Indonesian EFL settings," *Indonesian Journal of Applied Linguistics*, vol. 6, no. 2, p. 222, Jan. 2017, doi: 10.17509/ijal.v6i2.4847.
- [6] M. Melvina, N. Sri Lengkanawati, and Y. Wirza, "The Autonomy of Indonesian EFL Students: A Mixed Method Investigation," *International Journal of Learning, Teaching and Educational Research*, vol. 20, no. 11, pp. 422–443, Nov. 2021, doi: 10.26803/ijlter.20.11.23.
- [7] D. Daflizar and E. Petraki, "Readiness for autonomous English language learning: The case of Indonesian undergraduate students," *Indonesian Journal of Applied Linguistics*, vol. 11, no. 3, pp. 515–526, Jan. 2022, doi: 10.17509/ijal.v11i3.34259.
- [8] D. Daflizar, "Learner Autonomy: A Qualitative Inquiry into Indonesian Tertiary EFL Students' Voices," *Indonesian Research Journal in Education (IRJE)*, vol. 5, no. 2, pp. 387–403, Sep. 2021, doi: 10.22437/irje.v5i2.10388.
- [9] Organisation for Economic Cooperation and Development, *Vocational Education and Training in Thailand*. OECD Publishing, Paris, France, Jul. 2021, doi: 10.1787/cc20b6fd-en.
- [10] A. Susanti, S. Rachmajanti, and A. Mustofa, "Between teacher' roles and students' social: Learner autonomy in online learning for EFL students during the pandemic," *Cogent Education*, vol. 10, no. 1, Dec. 2023, doi: 10.1080/2331186X.2023.2204698.
- [11] D. Gardner and L. Miller, "Managing self-access language learning: Principles and practice," *System*, vol. 39, no. 1, pp. 78–89, Mar. 2011, doi: 10.1016/j.system.2011.01.010.

- [12] T. Lamb and G. Murray, "Space, place and autonomy in language learning," in *Space, Place and Autonomy in Language Learning*, Routledge, 2017, pp. 1–6, doi: 10.4324/9781317220909-1.
- [13] S. S. Roy and S. N. S. Gandhimathi, "Self-directed learning for optimizing sustainable language learning via mobile assisted language learning: a systematic review," *Frontiers in Education*, vol. 9, Jan. 2025, doi: 10.3389/educ.2024.1463721.
- [14] S. Van Nguyen and A. Habók, "Designing and validating the learner autonomy perception questionnaire," *Heliyon*, vol. 7, no. 4, p. e06831, Apr. 2021, doi: 10.1016/j.heliyon.2021.e06831.
- [15] A. AlJarrah, M. K. Thomas, and M. Shehab, "Investigating temporal access in a flipped classroom: procrastination persists," *International Journal of Educational Technology in Higher Education*, vol. 15, no. 1, p. 1, Dec. 2018, doi: 10.1186/s41239-017-0083-9.
- [16] F. Martin and D. U. Bolliger, "Engagement Matters: Student Perceptions on the Importance of Engagement Strategies in the Online Learning Environment," *Online Learning*, vol. 22, no. 1, Mar. 2018, doi: 10.24059/olj.v22i1.1092.
- [17] M. Balasubramani, P. Jose, M. P. Rajakumar, S. Devi, K. M. Navaneetha, and J. M. Robinson, "Methods for promoting students' active engagement in digital environments," in *Digital Tools and Platforms for Effective and Personalized Learning*, IGI Global Scientific Publishing, 2025, pp. 375–402, doi: 10.4018/979-8-3373-6013-3.ch014.
- [18] T. Jacob and S. Centofanti, "Effectiveness of H5P in improving student learning outcomes in an online tertiary education setting," *Journal of Computing in Higher Education*, vol. 36, no. 2, pp. 469–485, Aug. 2024, doi: 10.1007/s12528-023-09361-6.
- [19] U. Rahmi, B. Ramadhani Fajri, and A. Azrul, "Effectiveness of Interactive Content with H5P for Moodle-Learning Management System in Blended Learning," *Journal of Learning for Development*, vol. 11, no. 1, pp. 66–81, Mar. 2024, doi: 10.56059/jl4d.v11i1.1135.
- [20] S. Rama Devi, T. Subetha, S. L. Aruna Rao, and M. K. Morampudi, "Enhanced Learning Outcomes by Interactive Video Content—H5P in Moodle LMS," in *Inventive Systems and Control: Proceedings of ICISC 2022*, Singapore: Springer Nature Singapore, 2022, pp. 189–203, doi: 10.1007/978-981-19-1012-8_13.
- [21] T. R. Addhiny, "The Use of H5P Interactive Content in English Language Learning," *PANRITA Journal of Science*, vol. 1, no. 1, 2021.
- [22] P. Sinnayah, A. Salcedo, and S. Rekhari, "Reimagining physiology education with interactive content developed in H5P," *Advances in Physiology Education*, vol. 45, no. 1, pp. 71–76, Mar. 2021, doi: 10.1152/advan.00021.2020.
- [23] K. Mir, M. Z. Iqbal, and J. A. Shams, "Investigation of Students' Satisfaction about H5P Interactive Video on MOODLE for Online Learning," *International Journal of Distance Education and E-Learning*, vol. 7, no. 1, pp. 71–82, Jan. 2022, doi: 10.36261/ijdeel.v7i1.2228.
- [24] A. M. Mutawa, J. A. K. Al Muttawa, and S. Sruthi, "The Effectiveness of Using H5P for Undergraduate Students in the Asynchronous Distance Learning Environment," *Applied Sciences*, vol. 13, no. 8, p. 4983, Apr. 2023, doi: 10.3390/app13084983.
- [25] R. Kannusamy, "Digital Tools for Interactive E-Content Development," in *Redefining Virtual Teaching Learning Pedagogy*, Wiley, 2023, pp. 203–230, doi: 10.1002/9781119867647.ch12.
- [26] A. Kerr, "Fostering Self-Regulated Learning with H5P Technology: The Pedagogical Experiences of Educational Professionals," *International Journal of E-Learning & Distance Education/Revue internationale du e-learning et la formation à distance*, vol. 40, no. 1, Jul. 2025, doi: 10.55667/ijede.2025.v40.i1.1360.
- [27] M. Noutcha and S. Kieffer, "Blended Learning Based on H5P Interactive Exercises: Insights from a Case Study," in *Learning and Collaboration Technologies*, Cham: Springer Nature Switzerland, 2024, pp. 214–233, doi: 10.1007/978-3-031-61672-3_14.
- [28] F. Han and R. Ellis, "Combining self-reported and observational measures to assess university student academic performance in blended course designs," *Australasian Journal of Educational Technology*, vol. 36, no. 6, pp. 1–14, Dec. 2020, doi: 10.14742/ajet.6369.
- [29] H. N. S. Bölükbaşı and D. B. A. Yeşilel, "Self-determined Motivation in Online Language Learning Context: Its Relation to Autonomy Support and Needs Satisfaction," *Mextesol Journal*, vol. 49, no. 3, pp. 1–13, Oct. 2025, doi: 10.61871/mj.v49n3-11.
- [30] H. A. Khadawardi, "Autonomous Digital Language Learning Strategies of EFL Students Beyond the Classroom," *Arab World English Journal*, vol. 16, no. 4, pp. 493–514, Dec. 2025, doi: 10.24093/awej/vol16no4.27.
- [31] E. D. Jayanti, "English Teacher's Strategies to Foster Learner Autonomy in Online Learning Environment," in *Proceedings of the 2023 7th International Conference on Education and E-Learning*, Nov. 2023, pp. 73–78, doi: 10.1145/3637989.3637994.
- [32] A. B. C. Arteaga, J. Lastra Cordero, J. V. Peláez Álava, L. Segura Quiñonez, and N. D. Piza Burgos, "Impact of Feedback on the development of self-regulation and autonomous learning skills," *Seminars in Medical Writing and Education*, vol. 3, Dec. 2024, doi: 10.56294/mw2024.637.
- [33] W. Botha, "English-medium instruction in higher education throughout the Middle East, North Africa, and Sub-Saharan Africa," in *The Routledge Handbook of English-Medium Instruction in Higher Education*, London: Routledge, 2024, pp. 237–245.
- [34] A. Nagao and C. C. Chen, "Navigating EMI in Japanese higher education: An inquiry into EFL learners' successes and struggles," *International Journal of Language Studies*, vol. 19, no. 4, pp. 139–162, 2025, doi: 10.5281/zenodo.15631698.
- [35] Y. Nurymbetov, A. Shabdenov, Y. Abduldayev, A. Nogaibayeva, N. Bakic-Miric, and G. Kassymova, "Factors affecting student comprehension in EMI classrooms: Teachers' perceptions," *Jurnal Cakrawala Pendidikan*, vol. 44, no. 1, pp. 135–143, Jan. 2025, doi: 10.21831/cp.v44i1.76221.
- [36] N. Musty, "The relationship between English Medium Instruction and motivation: a systematised review," *Language Learning in Higher Education*, vol. 15, no. 2, pp. 431–446, Oct. 2025, doi: 10.1515/cercles-2024-0084.
- [37] M. M. Mahmud *et al.*, "Application and distribution of interactive HTML5 content within online courses to increase learner engagement," in *2025 6th International Conference on Information Technology and Education Technology (ITET)*, IEEE, May 2025, pp. 46–60, doi: 10.1109/ITET65804.2025.11101641.
- [38] M. Q. Patton, *Qualitative research & evaluation methods: Integrating theory and practice*. Thousand Oaks, CA, USA: SAGE Publications, 2015.
- [39] T. C. Reeves, S. McKenney, and J. Herrington, "Publishing and perishing: The critical importance of educational design research," *Australasian Journal of Educational Technology*, vol. 27, no. 1, Mar. 2011, doi: 10.14742/ajet.982.
- [40] D. Vlachopoulos and A. Makri, "Online communication and interaction in distance higher education: A framework study of good practice," *International Review of Education*, vol. 65, no. 4, pp. 605–632, Aug. 2019, doi: 10.1007/s11159-019-09792-3.
- [41] J. W. Creswell and V. L. P. Clark, *Designing and conducting mixed methods research*. Los Angeles: Sage Publications, 2017.
- [42] L. Cuesta Medina, "Blended learning: Deficits and prospects in higher education," *Australasian Journal of Educational Technology*, vol. 34, no. 1, Mar. 2018, doi: 10.14742/ajet.3100.
- [43] J. W. Creswell and C. N. Poth, *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. Los Angeles, CA, USA: SAGE Publications, 2018.
- [44] C. P. Niemiec and R. M. Ryan, "Autonomy, competence, and relatedness in the classroom," *Theory and Research in Education*, vol. 7, no. 2, pp. 133–144, Jul. 2009, doi: 10.1177/1477878509104318.

- [45] C. Tsihouridis, M. Batsila, D. Vavougiios, and A. Tsihouridis, "WebQuests: From an Inquiry-Oriented Instruction to the Connectivist Approach to Science Teaching for the 21st Century Learners," in *Advances in Intelligent Systems and Computing*, 2020, pp. 395–405, doi: 10.1007/978-3-030-40274-7_40.
- [46] N. Zanjani, S. L. Edwards, S. Nykvist, and S. Geva, "The important elements of LMS design that affect user engagement with e-learning tools within LMSs in the higher education sector," *Australasian Journal of Educational Technology*, vol. 33, no. 1, pp. 19–31, Nov. 2017, doi: 10.14742/ajet.2938.
- [47] C. R. Henrie, R. Bodily, R. Larsen, and C. R. Graham, "Exploring the potential of LMS log data as a proxy measure of student engagement," *Journal of Computing in Higher Education*, vol. 30, no. 2, pp. 344–362, 2018, doi: 10.1007/s12528-017-9161-1.
- [48] V. Braun and V. Clarke, "Thematic Analysis: A Practical Guide," *QMIP Bulletin*, vol. 1, no. 33, pp. 46–50, 2022, doi: 10.53841/bsqmp.2022.1.33.46.
- [49] P. Fusch, G. E. Fusch, and L. R. Ness, "Denzin's Paradigm Shift: Revisiting Triangulation in Qualitative Research," *Journal of Social Change*, vol. 10, no. 1, Jan. 2018, doi: 10.5590/JOSC.2018.10.1.02.
- [50] L. Birt, S. Scott, D. Cavers, C. Campbell, and F. Walter, "Member Checking: A tool to enhance trustworthiness or merely a nod to validation?" *Qualitative Health Research*, vol. 26, no. 13, pp. 1802–1811, Nov. 2016, doi: 10.1177/1049732316654870.
- [51] F. Martin, C. Wang, and A. Sadaf, "Student perception of helpfulness of facilitation strategies that enhance instructor presence, connectedness, engagement and learning in online courses," *The Internet and Higher Education*, vol. 37, pp. 52–65, Apr. 2018, doi: 10.1016/j.iheduc.2018.01.003.
- [52] M. Bond, S. Bedenlier, V. I. Marin, and M. Händel, "Emergency remote teaching in higher education: mapping the first global online semester," *International Journal of Educational Technology in Higher Education*, vol. 18, no. 1, p. 50, Dec. 2021, doi: 10.1186/s41239-021-00282-x.
- [53] L. Kohnke and B. L. Moorhouse, "Facilitating Synchronous Online Language Learning through Zoom," *RELC Journal*, vol. 53, no. 1, pp. 296–301, Apr. 2022, doi: 10.1177/0033688220937235.
- [54] B. J. Zimmerman, "Self-Regulated Learning: Theories, Measures, and Outcomes," in *International Encyclopedia of the Social & Behavioral Sciences*, Elsevier, 2015, pp. 541–546, doi: 10.1016/B978-0-08-097086-8.26060-1.
- [55] D. Nicol, "Guiding Principles for Peer Review: Unlocking Learners' Evaluative Skills," in *Advances and Innovations in University Assessment and Feedback*, Edinburgh University Press, 2014, pp. 197–224, doi: 10.3366/edinburgh/9780748694549.003.0011.
- [56] S. W. Chong and H. Reinders, "Technology-mediated task-based language teaching: A qualitative research synthesis," *Language Learning & Technology*, vol. 24, no. 3, pp. 70–86, Oct. 2020, doi: 10.64152/10125/44739.
- [57] A. H. Al-Hoorie and P. D. Macintyre, *Contemporary Language Motivation Theory: 60 Years Since Gardner and Lambert (1959)*. Bristol, England: Multilingual Matters, 2019, doi: 10.21832/ALHOOR5198.
- [58] F. H. Wang, "An exploration of online behaviour engagement and achievement in flipped classroom supported by learning management system," *Computers & Education*, vol. 114, pp. 79–91, Nov. 2017, doi: 10.1016/j.compedu.2017.06.012.
- [59] E. M. L. Wong, "Enhancing Accounting Education: Exploring the Impact of H5P Interactive Video Content in a Blended Flipped Classroom," in *2024 6th International Workshop on Artificial Intelligence and Education (WAIE)*, Sep. 2024, pp. 278–283, doi: 10.1109/WAIE63876.2024.00057.
- [60] F. G. Dampil, "The Integration of H5p Interactive Videos: An Empirical Examination of Effectiveness in Enhancing the Performance of Students in Differential Equations," in *Proceedings of the 2024 15th International Conference on E-Education, E-Business, E-Management and E-Learning*, Mar. 2024, pp. 1–5, doi: 10.1145/3670013.3670065.
- [61] D. F. Sasongko and S. U. R. Sari, "Effectiveness of Interactive Video Using H5P Plugin in Moodle-based E-learning to Enhance Teacher-Students' Understanding (Case Study: Differential Equation Class)," in *AIP Conference Proceedings*, 2025, vol. 3038, no. 1, p. 020001, doi: 10.1063/5.0254245.
- [62] B. Bortis, C. Bailey-Crow, and A. R. Naik, "Leveraging H5P plug-in technology to increase interactivity within an asynchronously delivered physiology lecture in the first year of medical school," *Advances in Physiology Education*, vol. 50, no. 1, pp. 284–291, Mar. 2026, doi: 10.1152/advan.00007.2025.
- [63] J. Broadbent, "Comparing online and blended learner's self-regulated learning strategies and academic performance," *The Internet and Higher Education*, vol. 33, pp. 24–32, Apr. 2017, doi: 10.1016/j.iheduc.2017.01.004.
- [64] K. Abe, T. Tanaka, and K. Matsumoto, "Students' Learning Attitude Extraction based on Learning Behavior Log of Fill-in Workbook," *IEEE Transactions on Electronics, Information and Systems*, vol. 141, no. 12, pp. 1437–1443, Dec. 2021, doi: 10.1541/ieej.iss.141.1437.
- [65] S. Liu and M. R. B. M. Saad, "Role of Extensive Reading in Vocabulary Development, Reading Comprehension, and Reading Speed: A Systematic Literature Review," *Eurasian Journal of Applied Linguistics*, vol. 11, no. 1, pp. 87–99, 2025, doi: 10.32601/ejal.111108.
- [66] J. van der Graaf *et al.*, "How to design and evaluate personalized scaffolds for self-regulated learning," *Metacognition and Learning*, vol. 18, no. 3, pp. 783–810, Dec. 2023, doi: 10.1007/s11409-023-09361-y.
- [67] C.-I. Huang and T. Wang, "Word learning and motivation through multimodal input for novice Chinese language learners," *International Journal of Chinese Linguistics*, vol. 12, no. 2, pp. 256–285, Oct. 2025, doi: 10.1075/ijchl.00039.hua.
- [68] M. Ismailov, T. K. F. Chiu, J. Dearden, Y. Yamamoto, and N. Djailova, "Challenges to Internationalisation of University Programmes: A Systematic Thematic Synthesis of Qualitative Research on Learner-Centred English Medium Instruction (EMI) Pedagogy," *Sustainability*, vol. 13, no. 22, p. 12642, Nov. 2021, doi: 10.3390/su132212642.
- [69] F. H. M. Asri, D. Singh, Z. Mansor, and H. Norman, "A Review of Cross-Cultural Design to Improve User Engagement for Learning Management System," *KSII Transactions on Internet and Information Systems*, vol. 18, no. 2, pp. 397–419, Feb. 2024, doi: 10.3837/tiis.2024.02.007.
- [70] R. F. Kizilcec, M. Pérez-Sanagustín, and J. J. Maldonado, "Self-regulated learning strategies predict learner behavior and goal attainment in Massive Open Online Courses," *Computers & Education*, vol. 104, pp. 18–33, Jan. 2017, doi: 10.1016/j.compedu.2016.10.001.

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