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Designing Effective and Practical Learning Activities in Higher Education Digital Pedagogy: A Systematic Review of Theories and Practices

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Abstract. Designing online learning activities that are both accessible to diverse learners and effective in fostering cognitive and social engagement poses significant challenges for educators in higher education. This paper addresses those challenges through a digital pedagogy lens by examining pedagogical theories and empirical studies on the design of learning activities. A systematic literature review was conducted using the Reporting Standards for Systematic Evidence Syntheses (ROSES), and data were analysed using thematic analysis. The findings indicate that theories such as andragogy, heutagogy, cybergogy, socio-constructivism, and the Interactive, Constructive, Active, Passive (ICAP) framework can inform the design of online learning activities. The synthesis of the empirical literature on passive, active, constructive, and interactive learning activities reveals that they impact students' cognitive and social engagement in various ways, highlighting the importance of using different kinds of learning activities to ensure online learning is effective. Furthermore, the implication is that the most effective and practical design of online learning activities is one that involves learners, considers their internet and technological access, and reduces the responsibility of the teacher for designing those activities. The role of educators in online classes should be thus targeted at directing and guiding learners' cognitive, social and meaningful learning.

Keywords: digital pedagogy; learning activities; learning design; online classes

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1. Introduction

Digital pedagogy refers to those teaching activities that use digital technologies to enhance students' learning (Montebello, 2021). In the context of higher education, digital pedagogy comprises three main constructs: teaching practices; design of learning activities; and digital pedagogy competence (Väätäjä & Ruokamo, 2021; Zhang & Yu, 2021). Of these, the design of learning activities is a crucial component that educators must master in order to avoid monotonous learner experiences, one-way lectures, and passive learning in higher education (Cowling et al., 2022; Lohr et al., 2022; Ma et al., 2022). Educators play a pivotal role in this, as they can shape learning experiences to ensure that students are socially engaged (Kabilan & Annamalai, 2022; Tice et al., 2021) through learning activities (Chi et al., 2021; Lohr et al., 2021).

However, designing online learning activities presents many challenges, ranging from technological design considerations—such as ensuring the learning activities can be accessed and completed by learners from various socioeconomic backgrounds (Cavinato et al., 2021; Kabilan & Annamalai, 2022; Vikas & Mathur, 2022)—to pedagogical concerns, such as ensuring that learning activities are both cognitively and socially engaging and that learning outcomes will be achieved (Chi et al., 2021; Raes et al., 2020; Tice et al., 2021). Cognitive engagement involves the active mental participation of learners. Students who actively think, solve problems, and apply knowledge are more likely to retain information. On the other hand, social engagement allows learners to interact with peers, share ideas and learn from one another. Indeed, the significance of ensuring cognitive and social engagement in the design of online learning activities cannot be overstated, as educators are required to provide "*learning activities, supportive contexts, and learning processes that allow for inclusivity and flexibility while offering learners a scaffolded, structured learning environment*" (McLoughlin & Oliver, 2000, p. 70).

Educators' inability to design interactive and socially engaging online learning activities significantly hinders student learning outcomes (Chi, 2021; Lohr et al., 2022). Interactive activities are essential for fostering meaningful engagement between students, educators, and peers, which enhances knowledge retention and overall academic success (Chi, 2018). Survey data from higher education contexts across multiple countries—including the UK (Børte et al., 2020), Italy (Ferri et al., 2020), Australia, China, Malaysia (Eri et al., 2021), India (Vikas & Mathur, 2022), and Cambodia (Ma et al., 2022)—consistently highlight limited interaction in online learning activities as representing a persistent challenge that hinders learning outcomes. Furthermore, studies by Crawford et al. (2021), Hofer et al. (2021), and Lohr et al. (2022) emphasise that improving the design of learning activities is critical to enhancing the quality of digital pedagogy in higher education. Designing engaging and interactive learning activities is crucial for fostering student participation, deepening engagement, and ultimately improving learners' academic performance in online classes.

Despite the growing body of research on digital pedagogy in higher education, there remains a lack of comprehensive studies that systematically integrate theoretical frameworks and practical approaches for designing effective online

learning activities (Crawford et al., 2021; Hofer et al., 2021; Lohr et al., 2022). While previous studies have explored various pedagogical theories, the understanding of how these theories translate into actionable strategies for instructional design remains limited, particularly in the context of online classes. Moreover, research to date has focused on isolated aspects of learning activity design, such as technology use or learner engagement, without addressing the holistic integration of theory and practice. Therefore, this study seeks to bridge these gaps by reviewing digital pedagogy's theoretical foundations in forming practical and effective implementations of online learning activities in higher education.

Purpose

This critical review constitutes a comprehensive analysis of both theoretical articles and empirical evidence from peer-reviewed studies. It aims to answer the following research questions:

1. How can pedagogical theories inform the effective design of online learning activities in higher education?
2. How can online learning activities be practically designed in higher education?

This paper critically reviews the design of online learning activities by examining digital pedagogy in higher education. Furthermore, it integrates adult learning, online learning, and pedagogy theories with empirical studies to bridge theory and practice. The focus is on those faculty-designed instructions, tasks, and assignments that use digital technologies in online, blended, or hybrid classrooms. In this critical review, we "*determined the type of literature required*" (Sutton et al., 2019, p. 36), which is a critical review focusing on theory and empirical research. By analysing both theoretical and empirical research, we aim to highlight both instructional design theories and practical strategies, thereby supporting educators in planning and delivering effective online learning activities (Castro & Tumibay, 2021).

2. Design of Learning Activities in Higher Education Online Classes

In designing learning activities in higher education institutions (HEI), the integration of theoretical frameworks and data facilitates informed decision-making for digital pedagogy practices and future research while gaining "*insights into seemingly given realities*" in terms of effecting changes within the relevant context (Koetting, 1996, p. 1143). Considering theoretical frameworks that are "*diverse and explicit*"—such as adult pedagogy, technology-integrated teaching, and computer-assisted learning theories—can contribute to the proliferation of existing knowledge through new insights (Yang et al., 2021, p. 465). Additionally, empirical studies in HEI contexts have demonstrated that educators are mindful of learners' cognitive and social engagement in online classes (Cavinato et al., 2021; Li et al., 2022; Raes et al., 2020). Educators also value students' presence, participation, and engagement in online classrooms but are often frustrated and may be questioning whether students are merely present, participating or engaged.

Empirical data can determine students' engagement in an activity-based learning design approach. For example, Rapanta et al. (2020) discovered that designing learning activities with specific characteristics that combine three types of presence (social, cognitive and facilitatory) increases student engagement. Similarly, in their mixed methods study, Rajabalee et al. (2020) found that the activity-based learning approach can motivate students and increase engagement in learning activities, fostering improved self-learning practices and higher social and cognitive skills. Hence, we postulate that rather than spending time undertaking 'trial and error' approaches to design practical and effective learning activities for online classes, a faster and more constructive approach would be to integrate theory and empirical data to inform digital pedagogy practices.

3. Methods

ROSES (Reporting Standards for Systematic Evidence Syntheses) was developed by Haddaway et al. (2018) to support sound methodology for a systematic literature review. ROSES was selected over other methods because this study intends to synthesise the design of online learning activities in higher education digital pedagogy. The strategy for document searching was planned and conducted based on three systematic phases: identification; screening; and eligibility. Eligibility includes a quality evaluation process based on the adapted criteria outlined by Hong et al. (2018). The strict evaluation process allowed for selected articles to be determined before integrating them into this review.

3.1 Identification

The identification process was achieved by deriving three main keywords from the research questions. The keywords used were 'online', 'learning' and 'design'. To ensure thorough findings, the authors also sought synonyms, related terms, and variations referring to the keywords used by past studies and keywords suggested by Scopus, as well as experts' opinions. Based on this process, several further keywords were also checked, as follows: online class, synchronous, asynchronous, online activities, university, and online learning design. Combinations of these keywords were also processed using search functions in the Scopus database, such as field code functions, phrase searching, wildcards, truncation, and Boolean operators.

The string search used was TITLE-ABS-KEY ((online) AND (learning*) AND (design*) AND (activities* OR pedagogy* OR strategy* OR theory* OR class* OR university OR asynchronous* OR synchronous OR "higher education")). Additionally, the search process included manual searching techniques. The handpicking method for systematic literature review was used in databases such as Science Direct, Emerald, Taylor Francis, Springer Link and Sage Journals (Shaffril et al., 2021). A total of 1188 potential articles were identified from the selected databases.

3.2 Screening

Screening was the second synthesis stage, in which articles were either included or excluded from the study according to specific criteria. The screening process included empirical articles published between 2013 and 2023. Articles published

prior to 2013 were removed. This timeline was selected because the number of published studies in this period (n=1188) was sufficient for a review (Kraus et al., 2022). The authors focused on collecting empirical research papers since they offered primary data and theoretical papers that were relevant to the research questions. Empirical and theoretical papers that were irrelevant to higher education contexts were removed. Only papers written in English were kept, while those written in other languages, such as Korean and Spanish, were removed to ease the analysis process. Book chapters and proceeding papers were also excluded as they did not meet the eligibility requirements of peer review.

3.3 Eligibility

In the third stage, eligibility was assessed to ensure the pre-selected articles were of sufficiently high quality for this synthesis. To ensure the eligibility of theoretical articles, the pre-selected articles were identified and selected based on their relevance to keywords in the research questions using the PICo method, which signifies 'P' (Population or Problem), 'I' (interest) and 'Co' (Context) (Lockwood et al., 2015). The Mixed-Method Appraisal Tool (MMAT) by Hong et al. (2018) was used to gauge the eligibility of empirical articles. The MMAT allows researchers to evaluate the following five types of studies: qualitative research, quantitative descriptive studies, randomised controlled trials, non-randomised studies, and mixed methods studies. "*Critical appraisal is about judgement making, and it is advised to have at least two reviewers independently involved in the appraisal process*" (Hong et al., 2018, p. 1). The reviewers of the articles are the authors. Figure 1 shows the three systematic phases of this synthesis: identification, screening, and eligibility.

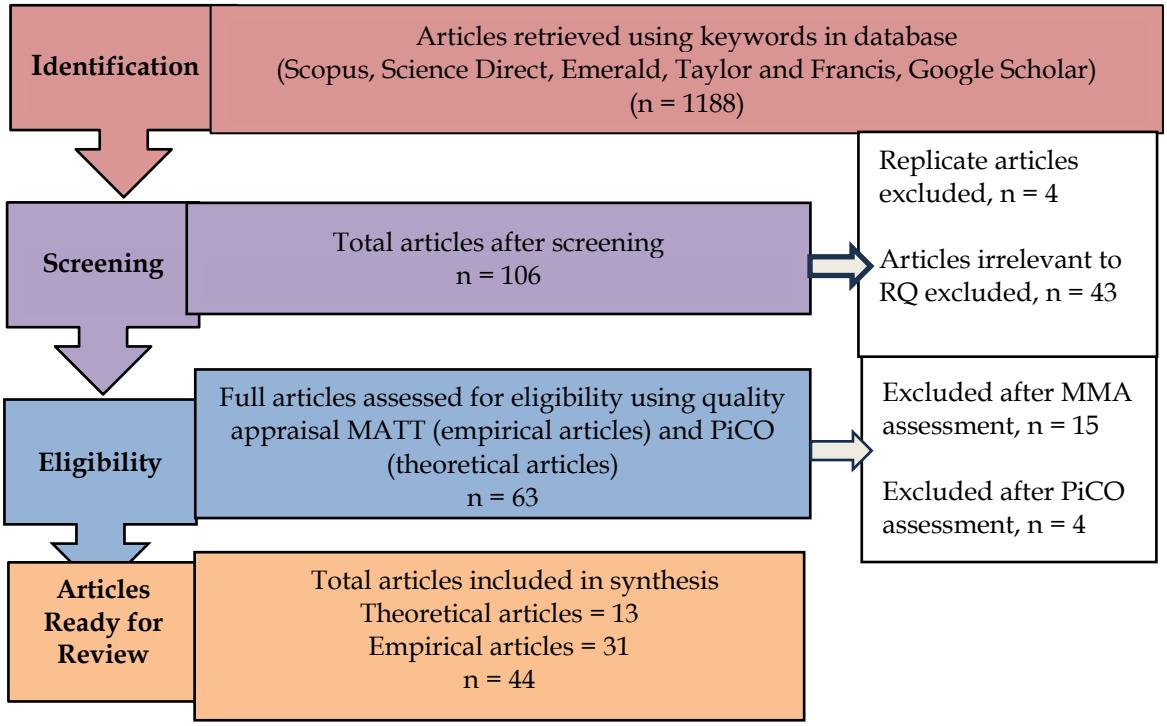

Figure 1: Systematic process of identification, screening and eligibility

The PICo method was used to determine the eligibility of theoretical articles. In this case, the Population (P) refers to educators and adult learners in higher

education; Interest (I) relates to the design of learning activities, and the Context (Co) refers to online/digital pedagogy (Lockwood et al., 2015). The authors excluded three theoretical articles that were irrelevant to the research questions' keywords and beyond this paper's higher education scope. Two theoretical articles on smart pedagogy and one on peer pedagogy were excluded as they were irrelevant to the research questions on the design of learning activities. Ultimately, the number of theoretical articles finalised and included in this review was 13.

As mentioned above, the quality assessment Mixed Methods Appraisal Tool (MMAT) (Hong et al., 2018) was used to assess the eligibility of empirical articles for this synthesis. The MMAT criteria assessment is performed by coding the types of studies, such as QN(DC) Quantitative Descriptive, QN (NR) Quantitative non-randomised, QN (R)Quantitative Randomised (QL)Qualitative, (MX) Mixed Method, and (C) Cannot Tell. The quality appraisal process includes such questions as: Is the sampling strategy relevant to addressing the research question? Is the sample representative of the target population? Are the measurements appropriate? Is statistical analysis appropriate to answer the research question? Of the empirical articles assessed, 15 failed to meet the quality criteria and were therefore excluded. The number of empirical articles that achieved the MMAT standards was 31. Table 1 shows the articles and the respective authors included in this synthesis.

Table 1: Article eligibility results using MMAT and PiCO

Type of article	n	Author/s
Theoretical (TA)	13	Anderson (2020); Chi and Wylie (2014); Chi et al. (2021); Garrison (2022); Hase and Kenyon (2000); Loeng (2018); Moore (2020); Rapanta et al. (2020); Sailer et al. (2021); Santoveña-Casal and Fernández Perez (2020); Väätäjä and Ruokamo (2021); Wang and Kang; (2006); Wozniak (2020)
Quantitative descriptive QN (DC)	9	Ansari and Khan (2020); Baber (2020); Chen (2019); Eri et al. (2021); Garris and Fleck (2022); Lohr et al. (2022); Murphy and Barry (2016); Richardson et al. (2017); Vikas and Mathur (2022)
Quantitative non-randomised QN (NR)	2	Hwang et al. (2015); Zainuddin et al. (2020)
Quantitative randomised QN (R)	2	Andel et al. (2020); Sanchez et al. (2020)
Qualitative (QL)	15	Alamri et al. (2020); Børte et al. (2020); Bygstad et al. (2022); Cavinato et al. (2021); Chandler (2016); Hirschel and Humphreys (2021); Kabilan and Annamalai (2022); Li et al. (2022); Mehrabi et al. (2020); Saltz and Heckman (2020); Romero-Hall and Vicentini (2017); Wang et al. (2018); Wang and Chen (2020); Zhang and Yu (2021); Zhu et al. (2020)
Mixed method (MX)	3	Awidi and Paynter (2019); Kabilan et al. (2023); Lamb and Arisandy (2020)
Total articles	**n = 44**	

3.4 Thematic Analysis

The selected articles were processed through thematic analysis and data extraction. Thematic analysis is a method for identifying, analysing, and reporting patterns (themes) within data (Clarke & Braun, 2013, p. 18). One of the benefits of thematic analysis is its flexibility. The role of the researcher is to identify patterns or themes, select interesting findings, and report them to readers. A theme captures something important about the data in relation to the research question and represents some level of patterned response or meaning within the data set (Braun & Clarke, 2006, p. 82).

Data from the selected articles were extracted using the six stages of thematic analysis proposed by Braun and Clarke (2006). In the first stage, the researchers familiarised themselves with the data. This involved reading and re-reading the data and noting down initial ideas. The second stage was to generate codes by systematically coding interesting strands across the data set before organising the data based on the codes (Table 2). Using the research question as a guide, the researchers extracted data from the articles. The excerpts were labelled with pre-codes and relabelled with final codes by circling, highlighting, or underlining significant words or sentences.

Using an inductive framework, the researchers attempted to note any interests, similarities, and connections between the extracted data to form themes. In the third stage, the researchers identified themes by grouping similar codes under one potentially overarching theme (Table 2). The themes developed were associated with the original data and reflected the entire data set (Braun et al., 2022). Next, the fourth stage involved reviewing the themes, finalising them and forming a thematic map or analysis. During this process, four main themes were developed. After that, the themes were defined and named in the fifth stage. Finally, in the sixth stage, the themes for the research questions are presented as shown below.

Table 2: Analysing data based on codes

Example excerpts of data	**Analyses (Notes, Comments)**	**Code**	**Theme**
*Learners favour the familiarity of face-to-face classrooms via video conferencing with audio quality as a crucial factor (*Wang et al., 2018). *Synchronous lectures improve the study habits of distance learners* (Romero-Hall & Vicentini, 2017). *Many students suggest that the recorded lectures uploaded to Moodle support their self-directed learning* (Li et al., 2022).	Learners prefer online lectures because they mimic face-to-face teaching. Lectures also improve online students' study habits because they are forced to sit in front of the screen at a set time. Students find recorded lectures useful when uploaded to learning management sites.	Listening to lectures	Passive learning activities

4. Findings and Discussion

Analysis revealed that the theoretical papers highlight three main themes: 1) Online pedagogy theories; 2) The socio-constructivist educator; and 3) The ICAP theory of instruction. Furthermore, the analysis of empirical data on the design of learning activities identified four main themes: 1) Interactive learning activities; 2) Constructive learning activities; 3) Active learning activities; and 4) Passive learning activities. Table 3 below depicts how the themes were mapped.

Table 3: Themes and codes

No	Research Questions	Theme	Codes
1	How can pedagogy theories inform the effective design of online learning activities in higher education?	Educator's online pedagogy theories	- *Andragogy* - *Heutagogy* - *Cybergogy*
		The socio-constructivist educator	- *Socio-constructivism* - *Community of inquiry*
		The ICAP theory of instruction	- *Interactive activities* - *Constructive activities* - *Active activities* - *Passive activities*
2	How can online learning activities be practically designed in higher education?	Interactive learning activities	- *Interacting with educators and peers orally or in writing* - *Participating in discussions in and out of class* - *Working on tasks or problems in small groups*
		Constructive learning activities	- *Written explanation* - *One-sided oral explanation*
		Active learning activities	- *Annotating texts* - *Answering objective questions* - *Finding learning materials and sharing with peers*
		Passive learning activities	- *Listening to short lessons* - *Listening to lectures* - *Reading texts*

4.1 Educators' Design of Online Learning Activities

In order to design practical and effective online learning activities in HEI online classes, the educator must decide whether to guide the adult learner (andragogy), give the learner freedom (heutagogy) or engage the learner (cybergogy). The

current design of online learning activities in HEIs reflects principles of andragogy. Most educators take an andragogical approach, whereby tasks are assigned with the independent adult learner in mind. Andragogy assumes that the adult learner is self-directed, experiential, and practical towards social roles, internally motivated to learn new knowledge, and more performance-centred than subject-centred (Knowles, 1985; Loeng, 2018; Wozniak, 2020). HEI educators teaching an online course typically instruct learners to listen to online lectures, complete tasks or assignments individually or in a team, and end the course with oral or written assessments (Quinn, 2023). When adult learners assume responsibility for their own learning, and the educator takes responsibility for leading and guiding, the andragogy theory is encapsulated in the design of online learning activities.

Table 4: Educators' online pedagogy theories

Terms	**Andragogy** Knowles (1985, in Wozniak, 2020)	**Heutagogy** Hase and Kenyon (2000)	**Cybergogy** Wang and Kang (2006)
Approach	Educator-guided, self-directed, independent learning.	Student self-directed and self-determined learning.	The educator promotes student-engaged thinking, behaviour, and emotions.

Introduced by Wang and Kang (2006), cybergogy emphasises learner engagement, with learners' thinking, behaviour and emotions being deeply connected to the culture of computers, technology and the internet. Cybergogy has three overlapping domains: cognitive, emotive, and social. Wang and Kang (2006) postulate that for online learning experiences to be successful, "*students must have sufficient prior knowledge, be motivated to learn and be positively engaged in the learning process. In addition, they must be comfortable with the learning environment and feel a strong sense of community and social commitment*" (p. 9). Furthermore, cybergogy also emphasises that emotive factors significantly affect students' engagement in learning. Based on the principles of cybergogy, the HEI educator must be sensitive to students' emotional states and take the initiative to channel students' emotions for productive learning.

The difference between cybergogy and andragogy is that the latter presupposes that all humans and cultures value ideals such as individualism, independence and self-direction. cybergogy, on the other hand, values community and ensures that learners are cognitively, emotionally, and socially engaged in the learning process. It stresses teacher presence, learner well-being, and a feeling of community. A pressing concern in HEI online learning contexts is the problem of inclusivity of learners from diverse socioeconomic backgrounds who have unreliable technological and internet access, resulting in a loss of learning opportunities (Cavinato et al., 2021; Kabilan & Annamalai, 2022; Vikas & Mathur, 2022). In cybergogy, the educator may have to consider ways to support and accommodate students who face barriers in accessing digital technologies. This technology assistance is to consider using e-learning tools that are accessible to all

learners, as cybergogy requires the educator to take responsibility for students' presence, engagement and learning in online classes.

In contrast to cybergogy, heutagogy forces learners to be responsible for their own learning. Metacognition, or learning to learn, is the focus. Heutagogy is a self-motivated learning method that promotes peer-based teaching (Hase & Kenyon, 2000). It represents a self-determined and self-adjusted learning style that is often reflected in Massive Open Online Courses (MOOCs), for which learners must be agile, self-paced, and independent (Wang et al., 2019). The advantage of heutagogy is that the responsibility is placed entirely on the learner. Arguably, a limitation of cybergogy is that it expects the educator to be responsible for learners. HEI educators are overloaded with numerous academic responsibilities and may not have sufficient time available to care for their learners' cognitive, emotional, and social well-being in online classes. However, heutagogy also has its own disadvantages. Most learners find it challenging to remain motivated in heutagogy-driven courses (Moore, 2020), with 75% to 85% of learners leaving MOOC courses prior to completion (Daradoumis et al., 2013; Mehrabi et al., 2020). In short, heutagogy promotes a learning style in which educators are not obliged to engage learners, resulting in a loss of interest in learning.

Perhaps the best approach for designing activities in online classes is to place responsibility on the learner for learning, with the educator guiding the learning activities. The current practice of designing activities in HEI online classes combines the pedagogical theories of andragogy, cybergogy and heutagogy. Knowles' andragogy highlights teacher-guided learning but ignores the relationship between the individual and the community. It also fails to consider how privilege attached to race and socio-economic backgrounds affects learning. Cybergogy addresses this issue and proposes that HEI educators should be invested in engaging learners' cognitive, emotional, and social aspects when designing learning activities. However, studies have also pointed out that social engagement is optional in achieving learning outcomes in online classes (Baber, 2020; Li et al., 2022). Recognising that adult learners are resourceful and can take charge of their learning, heutagogy advocates for self-adjusted learning, but learners can become demotivated without teacher guidance (Wang et al., 2019). Therefore, it is crucial that educators remain responsible for guiding learning, and holding to andragogy is appropriate.

4.2 The Socio-Constructive Instructor

HEI learners value online course designs containing selection, personalisation, self-direction, variety, and a community of learning (Alamri et al., 2020; Garris & Fleck, 2022; Wang et al., 2019). Designing such activities often requires educators to have a socio-constructivist inclination in digital pedagogy (Anderson, 2020; Väätäjä & Ruokamo, 2021; Zhang & Yu, 2021). Social constructivism suggests that successful teaching and learning depend heavily on discussion and interpersonal interaction. Bygstad et al. (2022) argue that learning results from interactions with teachers, peers, community, parents and social media. Online learning involves peers, community, and society.

> "*The digital learning spaces harnessed the redefinition of roles between students and teachers, allowing for new and deeper learning forms. With*

> *so many digital resources at hand, the task of the university teacher will be fewer lectures, to act more as a facilitator of resources, and to monitor activities and results over time.*" (Bygstad et al., 2022, p. 22)

Social models of online learning activities promote effective learning experiences, but independent models, in which students learn independently without peers, hamper learning (Børte et al., 2020; Santoveña-Casal & Fernández Perez, 2020). The pedagogical models have been empirically analysed in HEI online classes, with results showing that social and collaborative models promote a positive learning experience, strengthen inter-student relationships, and create a sense of belonging to a community with shared interests. In contrast, an independent model, which emphasises individual learning, hampers students' perceived learning (Santoveña-Casal & Fernández Perez, 2020).

The Community of Inquiry (CoI) framework, a popular social constructivist model of learning processes in online classes, places educators at the centre of the learning process (Garrison et al., 2010; Garrison, 2022). The CoI framework emphasises the role of educators in facilitating learners' ability to create and confirm meaning in a CoI (cognitive presence). Educators play a crucial role in fostering social presence, so that learners can project their social and emotional selves while educators facilitate and manage learning (teaching presence). In essence, the CoI framework captures the combined principles of andragogy (teacher-guided learning) and cybergogy (learner engagement, cognitive and social presence).

The socio-constructivist educator designs online learning activities under the assumption that meaning is developed by collaborating and interacting with others. Socio-constructivism, a social learning theory developed by Vygotsky (1978), posits that individuals actively participate in creating their knowledge. Vygotsky believed that learning occurs primarily in social and cultural settings rather than solely within the individual. Furthermore, the social constructivism theory focuses heavily on working in pairs and small groups. Wozniak (2020) explained that the educator manipulates the structure of the online environment to connect students to social networks. In such a situation, the educator is the "*director of the social environment in the classroom, the governor and guide of the interaction between the educational process and the student*" (Vygotsky, 1978, p. 49). In addition, Vygotsky (1978) developed the following formula for the educational process: "*Education is realised through the student's own experience, which is wholly determined by the environment, and the role of the teacher then reduces to directing and guiding the environment*" (p. 50).

4.3 The Interactive, Constructive, Active, Passive (ICAP) Theory of Instruction

The ICAP theory of instruction serves as a practical guide for teachers, directing them in designing activities that foster teacher presence, learners' self-directed learning, collaborative learning, and social presence in online classes (Chi et al., 2021). The theory categorises learning activities into four types: Interactive, Constructive, Active, and Passive (ICAP). Each type is associated with specific activities: Interactive design involves discussions; Constructive activities include writing essays; Active activities encompass underlining texts; and Passive

activities involve reading texts and listening to lectures (Chi & Wylie, 2014; Chi et al., 2021). The overarching goal of ICAP is to equip teachers with the necessary tools to create better-designed, engaging learning activities in online classrooms.

However, there are several reasons why the ICAP theory also provides practical guidance in designing learning activities. First, learners' outward behaviours and outputs can be seen in terms of the learning materials without needing to assess their internal cognitive processes. Second, it provides definitions that are more concrete for teachers to rely on in designing learning activities. Third, descriptions based on overt behaviours allow teachers to detect whether students are appropriately engaged in the learning activities. The ICAP's definition of engagement is pragmatically based on the absence or presence of observable learner behaviours.

Studies that have employed the ICAP design of learning activities have consistently shown its positive impact on student engagement, learning outcomes, and educator design competence. For instance, Sailer et al. (2021) found that such learning activities reflect students' cognitive processes and are closely linked to learning outcomes. Additionally, they propose that a combination of active and passive learning activities may be sufficient for lower-end learning. Furthermore, constructive and interactive learning activities are crucial in students' skill development, increasing the likelihood of inferring new knowledge. Lohr et al. (2022) conducted a study on the design of online learning activities among 1625 higher education HEI teachers in Germany using SEM analysis. They identified three levels of teachers in terms of designing digital learning activities: low level (passive activities); moderate level (passive and active activities); and high level (passive, active, constructive, and interactive activities).

4.4 Practical and Effective Design of Learning Activities

Empirical studies on the design of practical and effective learning activities can be categorised into four types: Interactive, Constructive, Active, and Passive. Dialogue, in which learners collaboratively produce a joint output with unique contributions from each participant, is classed as an interactive learning activity (Chi et al., 2021). One key form of interactive learning involves interaction with teachers or peers, either orally or in written form. Along with online knowledge-sharing behaviours, this type of interactivity has a significant impact on learner engagement and academic performance (Ansari & Khan, 2020; Baber, 2020; Cavinato et al., 2021; Wang et al., 2018). Teachers and learners can interact through various platforms such as video, chat features, whiteboards, or shared Google documents, fostering an environment in which students engage with and discuss shared documents—a practice aligned with social constructivist views that emphasise the importance of language and social interaction in learning (Cavinato et al., 2021; Zhu et al., 2020).

Participation in discussions outside of class hours constitutes another interactive learning activity. Many learners desire to interact with teachers and peers outside of regular class times, finding that these interactions contribute positively to their

learning experience (Li et al., 2022). Social presence during these discussions is linked to positive perceived learning outcomes, although not all students favour in-class group discussions (Andel et al., 2020; Baber, 2020; Richardson et al., 2017). Working on tasks or problems in small groups enhances the learning experience by generating more unique ideas and facilitating efficient communication. Pairing low- and high-performing students together within these groups has been shown to improve the quality of discussions and interactions (Chen, 2019; Zhu et al., 2020). Small group work increases student engagement, supports collaborative learning, empowers students to contribute actively, and allows teachers to step back from direct instruction. Moreover, student group leaders can initiate online meetings or breakout sessions, providing an organised space for collaborative efforts (Cavinato et al., 2021; Chandler, 2016; Saltz & Heckman, 2020).

When learners produce an output beyond the information they were initially provided, this can be classified as a constructive learning activity (Chi, 2021). One common constructive learning activity is providing written explanations, such as giving comments, completing worksheets, or answering open-ended questions. Written activities—including commenting on recorded video lessons—enhance social presence in online, video-centric learning environments. This sense of social presence is positively associated with perceived learning and satisfaction among learners (Andel et al., 2020; Awidi & Paynter, 2019; Richardson et al., 2017). Additionally, answering written questions allows learners to demonstrate their understanding, such as by completing worksheets after watching videos, which can effectively assess comprehension (Ansari & Khan, 2020; Cavinato et al., 2021). Questions that result in incorrect responses from learners are particularly useful for educators to identify misunderstandings of learning material. Thus, educators can provide feedback, allowing individuals or groups of students to further explain their answers (Ansari & Khan, 2020; Cavinato et al., 2021).

Another constructive activity that educators should consider comprises of one-sided oral explanations, such as video presentations and self-review exercises. Video presentations, especially shorter ones, are powerful tools that enable learners to critically engage with course content and share their insights with peers (Hirschel & Humphreys, 2021). Learners can self-assess their performances and reflect on their experiences by reviewing video recordings of their presentations. Because self-review exercises, using rubrics, offer substantial learning value to learners, educators would do well to incorporate this method into their teaching. Such exercises provide information that helps learners to improve their future performance (Hirschel & Humphreys, 2021; Murphy and Barry, 2016).

Active learning activities in online classrooms involve the learner's physical engagement with the material (Chi, 2021). One such activity is the process of finding learning materials—including written, audio, and video—keeping a learning journal and sharing these resources with peers. Empirical studies show that maintaining a learning journal leads to higher academic achievement, and sharing with peers strongly correlates with learning success (Ansari & Khan, 2020; Hwang et al., 2015). Another active learning strategy involves highlighting text

and making notes, which leaves visible traces of cognitive engagement and aids in constructing arguments, thereby promoting student argumentation. Furthermore, social annotation, whereby students critique or reflect on specific parts of texts in groups, is particularly effective and is recommended over traditional forum discussions for targeted engagement (Li et al., 2022; Zhu et al., 2020). Additionally, answering objective questions in online quizzes is useful for short-term assignments. Students who regularly complete quizzes tend to perform better on subsequent tests, with gamified quizzes significantly improving performance. However, studies have shown that the positive impact of gamification may diminish over time as the novelty wears off (Sanchez et al., 2020; Zainuddin et al., 2020).

Passive learning activities are defined as those in which the learner is not engaged in explicit active participation (Chi, 2021). Such activities include listening to short lessons, which are particularly beneficial for learners with limited internet access and are highly effective in language learning. Short, single-topic lessons delivered via YouTube videos or teacher-led short lessons provide a focused and accessible learning experience (Cavinato et al., 2021; Lamb & Arisandy, 2020; Wang & Chen, 2020). Another passive learning activity is listening to lectures. Many learners appreciate the familiarity of face-to-face classroom settings, replicated through video conferencing (Li et al., 2022; Romero-Hall & Vicentini, 2017; Wang et al., 2018). The lecture audio quality is crucial, and live lectures have been shown to enhance the study habits of distance learners, with recorded lectures uploaded to digital learning platforms supporting self-directed learning. Additionally, reading texts is a fundamental passive learning activity, especially in online classes, for which reading particular texts is often a prerequisite to understanding the concepts needed to participate in discussions (Goedhart et al., 2009; Zhu et al., 2020).

4.5 Implications

This critical analysis highlights that effective learning activities do not always require an educator's presence, as HEI learners can independently lead and engage in peer-initiated learning. Nevertheless, educators can encourage interactions during and beyond class hours to ensure that learners remain cognitively and socially engaged in meaningful learning experiences. Technological access and internet connectivity remain challenges for many HEI learners (Arun et al., 2024; Gombkötő et al., 2024; Madero-Gonzalez, 2025). To accommodate these limitations, learners can participate in cognitive and social learning activities at flexible times based on their technology access. Furthermore, they can take initiative by forming study groups, creating online communities through instant messaging apps, or scheduling virtual meetings to support one another in understanding and applying new concepts. This approach fosters autonomy, collaboration, and meaningful learning experiences.

However, significant barriers in higher education digital pedagogy remain, including the digital divide and faculty resistance to online classes (Mexhuani, 2025; Thelma et al., 2024). Resistance can be reduced when HEI educators guide learners to be self-directed in online learning activities. Higher education learners

should be encouraged to initiate learner-led interactive activities, which provide more flexibility in learning new material while lessening the burden of design on educators. While it is important for educators to design learning activities that encourage cognitive and social engagement, learners can also take a self-directed approach by collaborating on study units, modules, and assignments. In order to foster engagement, successful online classes must integrate practical and effective learning activities, combining reading annotation, listening to lectures, delivering student presentations, participating in discussions, and engaging in collaborative group work.

4.6 Limitations

Although the findings of this systematic literature review will undoubtedly prove useful to HEI educators, it nevertheless has several limitations. First, the selection of studies was limited to articles published in peer-reviewed journals and indexed databases, and may therefore have excluded relevant grey literature, conference proceedings, or industry reports. Second, the search strategy, while comprehensive, may have missed relevant studies due to variations in terminology and indexing inconsistencies across databases. Third, the review relied on the methodological quality and reporting of the included studies, which may have introduced bias or inconsistencies in findings. Finally, the scope of this review was constrained by language restrictions, as only studies published in English were considered.

5. Conclusion

This critical analysis offers actionable insights, theoretical implications and practical recommendations on learning activity design principles in higher education digital pedagogy. The online pedagogy theories of andragogy, heutagogy, cybergogy, socio-constructivism and the CoI model highlight the importance of teacher facilitation, learners' self-directed learning, collaborative learning, and social learning in online classes. Two caveats must be emphasised in order for learning activities to be considered practical and effective online classes. First, both HEI educators and learners need to be flexible in the design of learning activities. Secondly, the educators' and learners' cognitive and social presence is crucial. Flexibility refers to the need for both the HEI educator and the learner being responsible for creating learning activities that promote cognitive or social engagement. The ICAP framework is helpful as it classifies learning activities into Interactive, Constructive, Active and Passive. The design of interactive activities involves teachers, peers and learning materials in collaborative or social learning; constructive and active activities promote cognitive engagement in the learning process; and passive activities—although they may be considered less effective for meaningful learning —are nonetheless essential for the success of online classes.

Future research should explore HEI students' experiences with cognitively and socially engaging online learning activities. A qualitative study could compare student perspectives on educator-designed versus learner-designed learning activities, providing insight into their effectiveness. A quantitative survey could also assess students' preferences in terms of passive, active, constructive, and

interactive learning activities in online classes. Furthermore, pedagogy researchers could also investigate the development of sustainable learning materials, high-quality digital content, and video lessons to enhance cognitive, social, and meaningful learning experiences.

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