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# **Online Learning Engagement Among Students in Higher Education: A Systematic Literature Review**

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### **Abstract**

Online education is in high demand. Due to the flexibility, affordability, and accessibility of this form of education, an increasing number of students enroll in online education programs. However, higher education online environments (HEOEs) still have substantial dropout rates compared to in traditional learning contexts. These drops in academic success have been consistently linked to student's reduced learning engagement documented in HEOEs. Though research has extensively examined individual factors relating to online learning engagement, it lacks a conclusive integration into a clear framework. With prior studies indicating that social, psychological, and cognitive factors underpin online learning engagement, a systematic literature review was conducted to establish the most prominent factors for each domain and integrate them into a framework. Further, the results were used to give recommendations on how to foster learning engagement in students of HEOEs. The systematic review included 12 articles from various educational and geographical contexts. The results demonstrate that social interaction with peers and teachers, self-efficacy, and self-regulated learning are primary factors involved in HEOE learning engagement. Social interaction with peers was argued to satisfy needs for sense of belonging to a group and social support. Self-efficacy and self-regulated learning are crucial for dealing with the demands of increased self-learning in HEOEs. Implications and recommendations for future research are discussed.

*Keywords:* online learning engagement, higher education, interaction, self-efficacy, self-regulated learning

## **Online Learning Engagement Among Students in Higher Education: A Systematic Literature Review**

Online education is in high demand. With more universities offering courses or whole degrees online (Wong et al., 2021), traditional learning environments have been reconstructed. Communication between students and teachers as well as access to course material has been moved to a technology-mediated digital environment that students log-in to from home (Poon et al., 2022). Videos are, for instance, used to deliver content rather than in an instructor-led classroom (Wong et al., 2021). There are many types of online learning environments such as Co-Lab (van Joolingen et al., 2005), Blackboard (Chen et al., 2019), or Massive Open Online Courses (MOOCs) (Friðriksdóttir, 2017). What makes them attractive is that they offer greater flexibility, access to diverse course material, and more affordable education (Caskurlu et al., 2021). Online learners can choose when, where, and how to study (Wong et al., 2021). Though online learning environments offer many advantages, higher dropout rates and less study completion have been reported in contrast to in-class learning (Friðriksdóttir, 2017; Hsu et al., 2019; Shaikh & Asif, 2022). A factor repeatedly shown to be linked to these drops in online education is learning engagement (Maimaiti et al., 2021; Redmond et al., 2018; Yousaf et al., 2022).

### **Online Learning Engagement**

Online learning engagement refers to the student's active involvement, practice, and commitment to learning in an online environment (Chiu et al., 2021; Lin, 2021). It is most commonly conceptualized as a multidimensional construct constituting behavioural, cognitive, and emotional engagement (Deng et al., 2021). Behavioural engagement refers to observable behavioural performance in educational tasks, such as participation during class. Emotional engagement entails both positive and negative influences on the social academic environment and the learning. Cognitive engagement is the motivation and drive to devote

effort to understand learning material and master skills. Similar conceptualizations are found across literature (e.g., Miao et al., 2022) with some including other dimensions such as agentic engagement (i.e., initiating acts that influence learning and teaching) (Chiu et al., 2021; Lin, 2021).

Online learning engagement is closely linked to “learning quality, satisfaction, success and retention, reduced feelings of isolation, and improved students’ performance” (Deng et al., 2021, p.2). Indeed, engagement has been demonstrated to play a prominent role in maintaining students’ desire to learn (Abou-Khalil et al., 2021), ensuring successful study completion (Redmond et al., 2018), and decreasing school dropout rates (Miao et al., 2022). In comparison, disengaged students are overall less satisfied with their education (Yousaf et al., 2022) and more likely to drop out (Shaikh & Asif, 2022). Moreover, being engaged in an online academic learning environment is an important prerequisite for future work-related performances. Given the strong relation between academic and job performance (Niessen et al., 2018). In addition, more jobs are being offered online, therefore students who are engaged in an online environment and are familiar with its challenges are at an advantage. Indeed, being familiar with technology used in an online work environment reduces online-related stressors like technology overload (Ulfert et al., 2022). Similarly, experience with online learning is positively related to persistence decisions (Shaikh & Asif, 2022). To further understand the workings of online learning engagement in an academic environment, the underlying factors need to be targeted. Conclusively, two research questions guide this systematic literature review: (1) Which social, psychological, and cognitive factors are involved in online learning engagement? (2) To what extent do these factors facilitate and/or inhibit online learning engagement in higher education?

### **Factors Underlying Online Learning Engagement**

Underlying online learning engagement are various social, psychological, and cognitive factors. Social factors include, among others, social presence, interaction, space, identity, influence, and support (see Alenzi, 2022). Cognitive factors are characteristics that affect performance and learning, including attentional skills, memory, and reasoning (Roy, 2013). Psychological factors involve concepts such as motivation and self-efficacy (Beharu, 2018), mattering (Vaillancourt et al., 2021) and self-regulation (Wong et al., 2021). Notably, though the same factors underpin learning engagement in online and offline environments, such as self-regulation (Abou-Khalil et al., 2021) or social presence (Miao et al., 2022), fostering those differs between each environment. For instance, social interaction is generally high in offline academic environments, however it is markedly reduced online due to lack of physical interaction, facial expressions, and body language (Chiu, 2021; Miao et al., 2022). Studies indicate that social interaction is positively linked to a sense of belonging and connection with others (Chiu, 2021; Peacock et al., 2020). From the perspective of Self-Determination Theory (SDT), feeling connected to others (i.e., relatedness) is one of the three basic psychological needs (i.e., autonomy, competence, relatedness). When those needs are met, humans are motivated to engage in self-determined behaviour (Poon et al., 2022). Thus, when students feel connected to others through close contact and interaction with both peers and teachers, they are motivated to achieve intended learning outcomes (Hsu et al., 2019). Indeed, online academic environments that increase social interaction report higher learning engagement (Miao et al., 2022; Wissing et al., 2022; Yousaf et al., 2022). In conclusion, the presence, absence, and magnitude of social, psychological, and cognitive factors in online educational environments affect learning engagement. To help clarify how these factors affect online learning engagement, the characteristics of higher education online environments need to be defined.

### **Characteristics of Higher Education Online Environments**

Higher education online environments (HEOEs) involve technology-mediated, virtual learning programs with increased access independent of geographical location (Adeshola & Agoyi, 2022). They are more flexible (Redmond et al., 2018), affordable, and offer more diverse course material (Caskurlu et al., 2021). Students can enrol in courses (Wilhelm-Chapin & Kosalka, 2020) or whole degrees (Rashid & Asghar, 2016), deciding from a vast range of educational programmes, such as medicine (Wilhelm-Chapin & Kosalka, 2020), history, or physics (Miao et al., 2022). Because HEOEs are accessible from nearly anywhere (Abou-Khalil et al., 2021), they present with a high variability in ethnicity and age with some studies reporting a range of 18 to 47 years of age (Quigley et al., 2022). Due to the virtual platform and high flexibility, a major characteristic of HEOEs is self-regulated learning (Wong et al., 2021). Students are in diminished contact with peers and instructors (Poon et al., 2022) and need to balance external commitments with studying (Redmond et al., 2021). Engaging with content takes place mainly through technology, is flexible and variable (Caskurlu et al., 2021). Content can be presented via tools like videos, presentations, or quizzes (Rashid & Asghar, 2016). Students can also choose in how far they want to engage with the material (Wong et al., 2021). Lectures or presentations are often recorded (Cohen et al., 2022) and they can manipulate the online material (Wong et al., 2021), for instance by stopping, rewinding, or fast-forwarding a video (Wilhelm-Chapin & Kozalka, 2020).

### **Online Learning engagement in Higher Education Online Environments**

Research on how to be successfully engaged in HEOEs has proposed several social, psychological, and cognitive factors. Firstly, facilitating interaction with peers and teachers has been one of the most promising factors in literature. Successful interaction with teachers was reported when students were provided with timely, tailored, encouraging feedback (Shaik & Asif, 2022), guidance (Young et al., 2006), and opportunities to engage with content via various platforms and tools (Cohen et al., 2022). Teachers, who facilitate interaction between

students, also engage their students more than others (Miao et al., 2022). Social interactions foster and satisfy students' needs, such as sense of belonging (Peacock et al., 2020; Shaik & Asif, 2022) and social identity (Poon et al., 2022). Indeed, increasing social interaction is positively linked to online learning engagement (Miao et al., 2022). Secondly, studies indicate that students need to be highly self-efficient (Alemayehu & Chen, 2021), engage in self-regulated learning (Adeshola & Agoyi, 2022), be motivated (Park & Yun, 2017), and high on self-efficacy (Barclay et al., 2018). Thirdly, students need to be knowledgeable of the technology used (Rashid & Asghar, 2016) and have strong reasoning (Fellman et al., 2020) and planning skills (Wong et al., 2021), and be reflective (Dolan et al., 2017). In addition, the student is required to have sufficient resources like stable internet connection (Abou-Khalil et al., 2021) and finances (Shaik & Asif, 2022). These social, psychological, and cognitive factors are interrelated and influence each other. For instance, self-regulated learning involves cognitive planning abilities as well as motivational (i.e., psychological) aspects (Panadero, 2017). Likewise, social interaction is related to sense of belonging (Chiu et al., 2021) and identity (Poon et al., 2022).

In sum, facilitating learning engagement differs between online and offline academic environments (Caskurlu et al., 2021; Chukwuedo et al., 2021; Chiu et al., 2021; Miao et al., 2022). Ignoring these differences when constructing online learning environments can lead to a significant decrease in learning and performance (Adeshola & Agoyi, 2022). To facilitate online learning engagement in HEOEs, this study aimed to identify the factors that support engagement in online environments and combine them in one conclusive framework.

### **The Present Research**

There is much research on online learning engagement which taps into various online learning domains with different types of participants, measures, variables, and foci of evaluation (e.g., Abou-Khalil et al., 2021; Adeshola & Agoyi, 2022; Chui et al. 2021). By



incorporating the broad body of research into one conclusive framework, prominent factors involved in online learning engagement can be found. Moreover, these can be used to improve higher education online environments (HEOEs). For example, educational providers creating online offerings (for universities or organizational training), could create learning experiences that are similar to or better than in-class education. To find factors involved in learning engagement, a systematic literature review will be conducted.

Boland et al., (2017) name systematic literature reviews the “gold standard” for synthesizing information on a specific question as they follow concrete, transparent steps. They are also crucial for decision-making progresses because they incorporate the increasing amount of new research into one concise review. By doing that, systematic review support decision-makers in taking all important information into account and weighing their pros and cons. In this case, a systematic literature review can help develop a sound and holistic framework for HEOEs.

## **Methodology**

### **PRISMA**

The PRISMA guidelines for conducting systematic literature reviews guided the systematic review process. A 27-item checklist (Appendix) and a four-phase flow diagram (figure 1) document the individual steps take. Examples of checklist items are explaining the rationale for the review, specifying eligibility criteria, and documenting the search including data sources and search string. Adhering to those guidelines is essential for being transparent about the review process and ensure the completion of it (Moher et al., 2009).

### **Literature Search**

The current research focuses on literature concerning factors important in fostering learning engagement in an online environment. Relevant papers were searched for in June

2022 using the following databases: EBSCO host, ProQuest, Science Direct, Scopus, and Web of Science. Articles were limited to English. The following search string was entered:

*Online learning OR e-learning AND online engagement OR virtual engagement AND higher education OR college OR university OR tertiary education NOT Teacher OR lecturer OR professor OR educator OR tutor OR instructor*

Science Direct did not allow for a search string exceeding 8 words. Thus, the search string was shortened to *Online learning OR e-learning AND online engagement AND higher education OR college OR university NOT Teacher OR lecturer OR professor*. Due to time constraints, only the first 100 articles for databases exceeding 100 articles were taken. The initial search yielded 434 articles in total. Duplicates were removed which left a total of 401 articles.

### **Criteria**

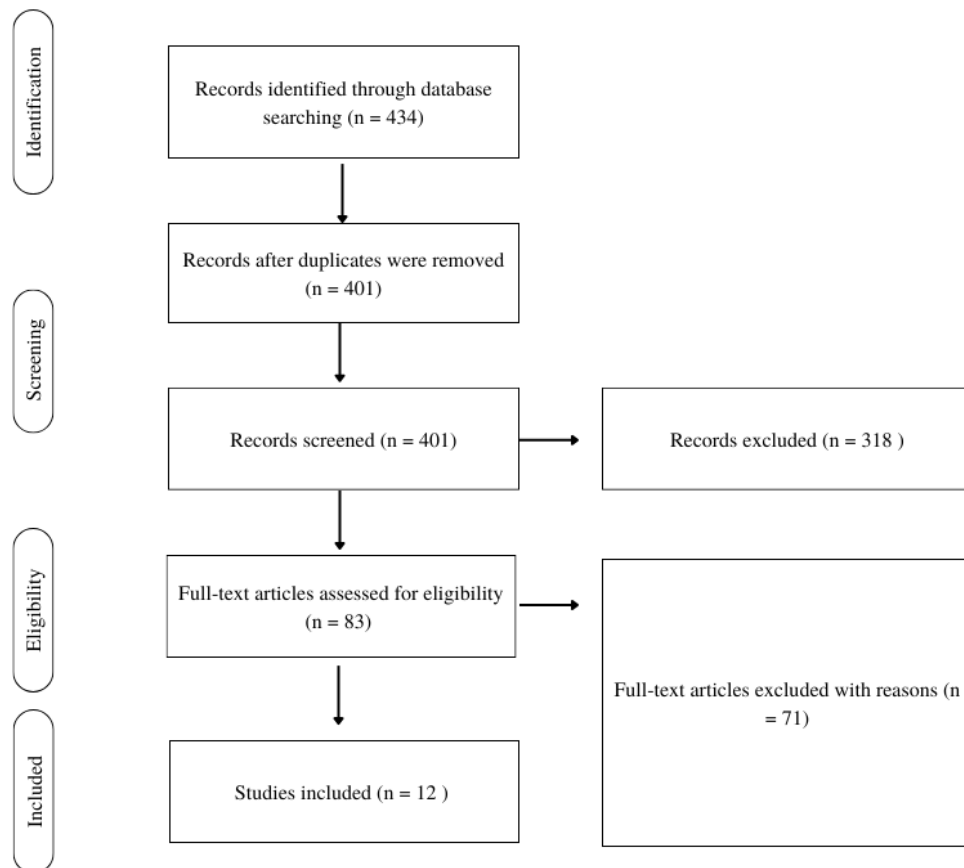
Criteria prior to the literature search are set to answer specific research questions. Inclusion and exclusion criteria further ensure that biases are minimized and that sound conclusions can be drawn (Moher et al., 2009). Studies were included according to the following rules; (1) they had to be full-text peer-reviewed articles; (2) the reviews were about the application of online learning; (3) based on online-learning in higher education; (4) qualitative or quantitative research design; and (5), local and international papers were included.

Exclusion criteria were as follows; (1) literature in other languages than English; (2) online learning engagement used in other contexts, such as organizations; (3) online learning engagement in other educational environments like primary or secondary school; (4) articles that had to be purchased and (5) grey literature like conference proceedings. The first, second, and last round of articles was excluded due to the screening of the title, abstract, and full text, respectively. Reasons for exclusion were, among others, the unavailability of a full-text or the

inclusion of a sample not from higher education. This led to a final number of 12 articles (figure 1).

**Figure 1**

*Flow Chart of the Screening Process*



### Coding

After an initial screening of the articles, three different categories were determined: (1) social, (2) cognitive, and (3) psychological. Articles that belonged to not only one dimension were subdivided further. This resulted in three sub-dimensions: (1) social-cognitive, and (2), social-psychological, (3) social-cognitive-psychological

### Analysis

The selected studies were content analyzed and summarized under the following categories: (1) social, (2) behavioural, (3) cognitive and the sub-dimensions. Lastly, the identified factors will be explained in the context of the three types of interactions in an academic environment: student-student, student-content, and student-teacher. Table 1 provides an overview of the studies including the type of study design, sample size, the dimension(s), and relevant results.

**Table 1**

***Results***

Author	Type of design	Sample size	Categories	Relevant results
Wissing et al. (2022)	Quantitative	372	Social	Peer network size & perceived social support
Purarjomandlandgrudi & Chen (2019)	Qualitative	67	Social-cognitive-psychological	Two categories: individual & behavioural and course-related & technology design factors
Wilhelm-Chapin & Koszalka (2020)	Qualitative	14	Social-cognitive	Student-content interaction
Dolan et al. (2017)	Review	/	Social-cognitive	Cognitive, teaching, and social presence
Kahn et al. (2016)	Qualitative	22	Social-cognitive	Collective reflexivity
Sun et al. (2018)	Quantitative	191	Social-cognitive	Intelligent online encouragement plus warning feedback
Barratt & Duran (2021)	Quantitative	465	Social-psychological	Psychological capital, social support can buffer low psychological capital
Peacock et al. (2020)	Qualitative	60	Social-psychological	Sense of belonging. Facilitating sense of belonging via interaction/engagement, culture of learning & support
Purarjomandlandgrudi & Chen (2020)	Qualitative	246	Social-psychological	Student's personal attributes & perceived course characteristics, interaction
Tseng et al. (2020)	Quantitative	254	Psychological	Growth mindset & learning self-efficacy
Quigley et al. (2022)	Quantitative	301	Psychological	Personality traits & stress perception
Alemayehu & Chen (2021)	Quantitative	353	Psychological	Motivation, self-efficacy, and self-monitoring influence

*Note: summary of the articles included in the systematic literature review*

**Results**

The analysis included 12 articles out of which six were quantitative, five qualitative, and one a review. Articles can further be divided into those focusing on dispositional characteristics such as personality (Quigley et al., 2022), on constructs like self-efficacy (e.g., Alemayehu & Chen, 2021), and on processes like social interaction (e.g., Purarjomandlandgrudi & Chen, 2020) that aim at facilitating factors underpinning online learning engagement. Subjects were from various academic fields such as Psychology (Quigley et al., 2022), Health Sciences, Arts, Social Sciences, and Management (Peacock et al., 2020). Students were graduates (Tseng et al., 2020), enrolled in online courses (Purarjomandlangrudi & Chen, 2020), undergraduate (Tseng et al., 2020) and postgraduate degrees (Barratt & Duran, 2021). The age of participants ranged from 17 (Wissing et al., 2022) to 72 (Quigley et al., 2022) and students were from different geographical areas throughout Africa, Europe, Asia, North America (Kahn et al., 2016), and Australia (Purarjomandlandgrundi & Chen, 2020). The most important results are summarized in figure 2. It includes factors most prominently found to be involved in online learning engagement, with “most prominent” defined as those mentioned most frequently.

### ***Psychological***

Three articles considered the extent to which psychological factors affect online learning engagement among students. The first article examined personality traits and stress perception as correlates with learning engagement (Quigley et al., 2022). The authors reported that conscientiousness positively predicted all types of online engagement. Neuroticism predicted engagement skills and emotional engagement. Openness to experience predicted emotional engagement. Stress perception negatively predicted performance. In Alemayehu and Chen’s (2021) study, motivation had a weak direct influence on online learning engagement in another study. Self-efficacy and self-monitoring were found to partially mediate this relationship. Additionally, Alemayehu and Chen (2021) reported that self-

efficacy had a direct influence on learning engagement. Lastly, Tseng et al. (2020) discovered that both learning self-efficacy and having a growth mindset positively influenced online learning engagement. In conclusion, self-efficacy and self-monitoring were the most prominent psychological factors found in this review as they were mentioned by two articles (Alemayehu & Chen, 2021; Tseng et al., 2020), along with positive effects of Conscientiousness and Openness and reduced levels of Neuroticism and stress perception on online learning engagement mentioned in one article (Quigley et al., 2022).

### ***Social***

One article focused on social factors influencing online student learning engagement in the context of peer relationships. Wissing et al. (2022) administered a survey to medical students who were forced to attend online classes due to COVID-19 measures. The survey assessed education satisfaction, study engagement, peer network size and perceived peer support. Online education had a negative association with online engagement and satisfaction. However, this was moderated by peer relationships. Online students with positive, larger peer relationships which offer support were reported to be more engaged online (Wissing et al., 2022).

### ***Social-psychological***

Three articles considered both social and psychological factors and their effect on online learning engagement. In Peacock et al.'s study (2020), sense of belonging was positively related to student engagement and significantly influenced by interaction with both peers and tutors. Students strive to be known by their tutor, feel supported and welcomed. Feeling connected to other peers and building a community through interaction was deemed equally important (Peacock et al., 2020). In an online survey administered to postgraduate students by Barratt and Duran (2021), psychological capital (i.e., the "composite construct originating from positive psychology made up from self-efficacy, optimism, hope, and

resilience” (Barratt & Duran, 2021, p. 2), positively predicted learning engagement. Social support served as an influential moderator where higher levels of social support buffered lower levels of psychological capital. Likewise, social support further increased the positive effects of high psychological capital on learning engagement (Barratt & Duran, 2021). Students’ personal attributes and perceived course characteristics were also found to impact online learning engagement either directly or through interaction (Purarjomandlandgrudi & Chen, 2020). Personal attributes were broken down into communication competencies, self-regulated learning, and attitude towards learning and more strongly associated with engagement compared to online interaction. Perceived course characteristics can be understood as sense of presence, sense of identity, and sense of purpose and were more strongly associated with online interaction compared to engagement. Thus, online interaction was an important mediator of the positive relationship between perceived course characteristics and learning engagement. Sense of purpose (component of perceived course characteristics) was the strongest individual predictor, showing a path coefficient of .708 with online interaction. It was also the second strongest predictor of engagement with a path coefficient of .336. Only sense of presence had a stronger direct effect of engagement (path coefficient of .358) (Purarjomandlandgrudi & Chen, 2020).

### ***Social-cognitive***

Four articles found social-cognitive factors to affect online student engagement. Dolan et al. (2017) demonstrated that building an online community that fosters social, cognitive, and teaching presence facilitates learning engagement through reflection and collaboration. Presence refers to practices that are recognized by the student as taking place and are aimed at increasing learning engagement. Teaching presence is fostered via personalized and supportive teaching methods such as personal greetings or the use of first names. A social presence is forged through interactions that reflect common goals and shared interests and

further promotes learning engagement. Cognitive presence is facilitated when students are asked challenging questions or taking part in debates. Wilhelm-Chapin et al. (2020) identified that ways for students to interact with content is through course learning resources and discussions. Based on that, higher levels of social presence and teaching presence in online courses was related to higher student engagement. In Sun et al.'s (2018) study, higher learning engagement was caused by the joint use of encouragement and warning feedback in an intelligent learning environment. Encouragement plus warning feedback stimulated students' willingness to learn as it presented the content as "more appealing, interactive, and emotionally supportive" (Sun et al., 2018, p. 1305). Kahn et al. (2016) emphasized reflexivity, which is defined as the "ordinary mental capacity of seeing oneself in relation to one's social setting" (Kahn et al., 2016, p. 2). They acknowledged different practices through which students engaged in reflexivity. Triggering collective reflexivity, having and pursuing common goals collaboratively, was highly related to learning engagement and facilitated by discussions, encouragement, or identifying common interests (Kahn et al., 2016).

### ***Social-cognitive-psychological***

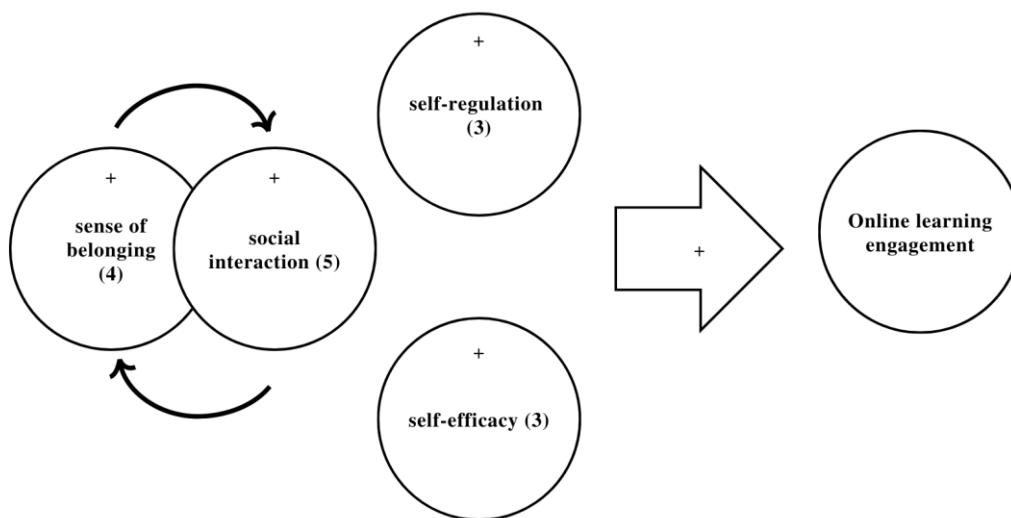
Purarjomandlandgrudi and Chen (2019) evaluated social, cognitive, and psychological factors impacting online learning engagement by focusing on interaction. As such, personal characteristics as well as design characteristics of the online learning environment were proposed to interrelatedly affect learning engagement. Notably, social factors alone or in combination were most prominent such as group discussions, sense of presence, knowledge sharing, polls and quizzes, and communicationality. In addition, psychological factors such as high motivation or cognitive factors like low distraction positively affected learning engagement. Importantly, all factors were reported as being involved in interaction which subsequently affected learning engagement. For example, individuals high on motivation were more participative and those knowledgeable of technology adopted the only online



academic environment more readily which increased participation (Purarjomandlandgrudi & Chen, 2019).

**Figure 2**

*Factors Involved in Online Learning Engagement*



*Note:* This figure displays the most prominent factors involved in online learning engagement. “Most prominent” is defined as those mentioned most frequently. The numbers in the parentheses indicate how many articles mentioned that specific factor. Sense of belonging and social interaction have a reciprocal relationship with sense of belonging leading to higher social interaction and vice versa. Higher levels on all of those factors are related to higher levels of online learning engagement.

### **Discussion**

Online learning engagement is the student’s active involvement, practice, and commitment to learning in an online environment (Chiu et al., 2021; Lin, 2021). Studies on online learning in students frequently report lower rates of study persistence and completion rates (Shaikh & Asif, 202; Yousaf et al., 2022) caused by significant drops in learning

engagement (Friðriksdóttir, 2017; Shaikh & Asif, 2022). As facilitators struggle to increase online learning engagement, the question of which factors underpin online learning engagement and how we can facilitate or reduce them, remains (Redmond et al., 2018).

The aim of this systematic literature review was to identify factors that inhibit or foster learning engagement higher education online environments (HEOEs). Based on 12 articles, social, psychological, and cognitive domains as well as combinations of those were identified. Articles focused on either dispositional characteristics such as personality (Quigley et al., 2022), constructs like self-efficacy (e.g., Alemayehu & Chen, 2021), or processes like social interaction (e.g., Purarjomandlandgrudi & Chen, 2020) that were said to foster factors related to online learning engagement. Given that fewer articles considered factors in purely one domain, it can be said that a combination of the different domains, rather than individual ones, is crucial for constructing effective online learning environments for students in HEOEs which is in line with past research suggesting that more nuanced than distinct approaches for increasing online learning engagement are useful (Redmond et al., 2018).

### **Positive Factors Involved in Higher Education Online Learning Engagement**

Social, psychological, and cognitive factors were identified as supporting online learning engagement in higher education online environments (HEOEs). Social factors include, among others, social presence, interaction, space, identity, influence, and support (see Alenzi, 2022). Cognitive factors are characteristics that affect performance and learning, including attentional skills, memory, and reasoning (Roy, 2013). Psychological factors involve concepts such as motivation and self-efficacy (Beharu, 2018), mattering (Vaillancourt et al., 2021) and self-regulation (Wong et al., 2021).

In this review, eight articles highlighted the positive effects of social factors, either alone or in combination with cognitive or psychological factors, on learning engagement in higher education online environments (HEOEs). Of these articles, five showed that social

interaction with peers and teachers, as a process, was the most prominent, positively associated factor with online learning engagement (Dolan et al., 2017; Peacock et al., 2017; Purarjomandlangrudi & Chen, 2020; Purarjomandlangrudi & Chen, 2019; Wilhelm-Chapin & Koszalka, 2020). Further, three articles showed that social support (Barratt & Duran, 2021; Wissing et al., 2022) collective reflexivity (i.e., having and pursuing common goals collaboratively) (Kahn et al., 2016) were positively related to online learning engagement.

Together, the positive effects of social factors on online learning engagement can be explained by Self-Determination Theory (SDT). Of the three basic psychological needs, social factors can be assumed to foster relatedness (i.e., need for belonging to a group) (Chiu et al., 2022). When this need is met, individuals have been shown to be more self-determined (Chiu et al., 2022), which, in turn, might reflect itself in their learning engagement. For example, Dolan et al. (2017) found that self-determined students were more persistent and committed to as well as perceived themselves to be more responsible for their learning and, thus, displayed a higher level of online learning engagement. Similarly, Purarjomandlangrudi and Chen (2020) showed that students with a strong sense of belonging to their social learning community interact more with it, which, in turn strengthens their sense of belonging, thus positively affecting learning engagement.

Self-efficacy and self-monitoring are two important psychological constructs impacting online learning engagement (Alemayehu & Chen, 2021; Barratt & Duran, 2021; Tseng et al., 2020). In three articles, self-efficacy, which has been defined as “people’s beliefs in their capabilities to produce desired effects by their own actions” (Bandura, 1997, p. 7), has been shown to be a predictor and mediator of online learning engagement (Alemayehu & Chen, 2021; Barratt & Duran, 2021; Tseng et al., 2020). Self-efficacy was shown to mediate the positive effects of motivation (Alemayehu & Chen, 2021), growth mindset, and flexible thinking (Tseng et al., 2020) on learning engagement. Closely related, other research has

shown that students high on self-efficacy adapt their learning strategies (Greene, 2015) and exert more effort to overcome learning challenges by seeking help from peers (Schunk & Mullen, 2012). A construct similar to self-efficacy is self-monitoring where the learner perceives themselves as being the source of and having the responsibility for their own learning process (Alemayehu & Chen, 2021). This review demonstrates that self-monitoring facilitates the positive effects of motivation on learning engagement (Alemayehu & Chen, 2021). This is in line with Sze-yeng and Hussain (2010) who found that students high on self-monitoring exert more effort in acquiring new skills and knowledge.

Furthermore, one article indicated that dispositional characteristics, namely personality traits and stress perception, affect learning engagement (Quigley et al., 2022). Conscientiousness, Neuroticism, Openness, and stress perception were all significant predictors of online learning engagement. Conscientiousness has been repeatedly shown to be a significant positive predictor of academic success, both online and on-site. With respect to this, Alkis and Temizel (2018) demonstrated that individuals high on conscientiousness are more disciplined and structured in their learning. The positive relationship between academic performance and openness has also been demonstrated in other research (Mammadov, 2021). However, the relationship between Neuroticism and learning engagement is less clear. While some studies found no correlation (e.g., Alkis & Temizel, 2018) other studies emphasize a context-specific relationship (e.g., Lavrijsenet al., 2022). As example, in Guterman's (2020) study, students high on Neuroticism and performance avoidance showed a significant positive correlation with final grades. Of note, studies on online engagement are sparse but support the results of the association between Conscientiousness and Openness with online engagement with such individuals being more successful in adapting to the challenges of an online learning environment (Yu, 2021).

### **Negative Factors Involved in Higher Education Online Learning Engagement**

While most articles focused on factors fostering online learning engagement like social interaction (e.g., Dolan et al., 2017) or self-efficacy (e.g., Barratt & Duran, 2021), five articles also examined factors which inhibit learning engagement. Most factors negatively associated with learning engagement are those related to the lack of social factors, especially the lack of social interaction (Barratt & Duran 2021; Dolan et al., 2017; Sun et al., 2018; Wissing et al., 2022).

In line with this, Dolan et al.'s (2017) review explained that a lack of a social community in online learning can lead to learning disengagement due to feelings of isolation, frustration, boredom and overload. Likewise, Sun et al. (2018) reviewed literature showing that students in online learning environments lacking social interaction and support were more likely to be disengaged. In a similar vein, in Wissing et al.'s (2022) study, disengaged students were those holding a negative attitude towards online learning which was presumably linked to the preference for face-to-face education. These results can again be linked to Self-Determination Theory (SDT) where feeling like part of a group is an important need (i.e., relatedness) that, when unfulfilled, leads to students being less self-determined and, consequently, disengaged in their learning (Chiu et al., 2021).

Barratt and Duran (2021) extend these findings by showing that less social interaction as well as the dual demands of work and studying linked to online learning can lead to learning disengagement through the depletion of psychological capital. Psychological capital, meaning self-efficacy, optimism, hope, and resilience, is drained more easily as students try to adapt to these challenges. That online learning demands more personal resources, such as higher levels of self-efficacy, has been supported by articles in this review (e.g., Alemayehu & Chen, 2021), as well as other studies (Kuo et al., 2021). Lastly, Kahn et al. (2016) focused

on individual differences in online learning engagement. They noted how self-regulated learning and high technology use, are difficult for some students to get accustomed to. Specifically, while some students struggle with getting acquainted with the technology used in an online learning environment, others have difficulties with self-regulating their learning (Kahn et al., 2016).

### **Practical Implications**

#### **Fostering Positive Factors Involved in Higher Education Online Learning Engagement**

Based on this research, increasing social interaction with peers and teachers is one of the most promising rationales for increasing learning engagement in HEOEs (Barratt & Duran, 2021; Dolan et al., 2017; Peacock et al., 2021; Wissing et al., 2021), fostering a sense of belonging (Chiu et al., 2021; Peacock et al., 2021) and support (Wissing et al., 2021). Several propositions can be made on how to increase student-student and student-teacher interaction.

Student-student interaction can be fostered through interactive teaching methods and by giving students the opportunity to interact with their peers (Dolan et al., 2021). Interactive teaching methods include in-class discussions (Dolan et al., 2017; Wilhelm-Chapin & Koszalka, 2020) and peer working tasks (e.g., group assignments) (Barratt & Duran, 2021; Wissing et al., 2021). For instance, teachers can stimulate discussions by dividing their students into groups digitally and having them debate about a certain topic (Dolan et al., 2017). Breakout rooms give students the opportunity to engage with each other as well as well as peer support workshops or virtual peer support groups (Wissing et al., 2021). Synchronous online learning allows for live interactions with others (Peacock et al., 2021). Interaction between peers can be made more meaningful by fostering a sense of belonging via early introduction sessions (e.g., “Why am I taking this course? What are my goals?”) (Peacock et al., 2021) and the introduction of common learning goals (Kahn et al., 2016). Student-

centered learning through interaction with peers is a fruitful approach in research on online learning engagement in HEOEs (Miao et al., 2022). For instance, Collaborative Online International Learning (COIL) is a successful teaching method for increasing learning engagement through peer learning and interaction. COIL is an online collaboration approach where communication between students is the main rationale for learning. While interacting via Skype or WhatsApp, students acquire the knowledge from and through each other, rather than a teacher (Naicker et al., 2021)..

Student-teacher interaction is most successful when teachers are perceived as being interactive, emotionally supportive, and encouraging (Dolan et al., 2017; Young, 2006). This can be achieved by using personal introduction videos, verbal communication, and (inter)active presentations (Dolan et al., 2017). Signaling teacher presence can further facilitate the student-teacher relationship (Dolan et al., 2017). Teachers being virtually present by giving frequent online announcements (Wilhelm-Chapin & Koszalka, 2020), quick, constructive, and timely feedback (Purarjomandlandgrundi & Chen, 2019), and multiple communication options convey a supportive and encouraging atmosphere to their students (Dolan et al., 2017). These findings are in line with research demonstrating an increase in learning progress in an online class which used interactive methods, gave effective feedback, and where the teacher was engaged (Ayanbode et al., 2022) Similarly, Young (2006) found that motivation, emotional support, and high communication were among the most effective teaching techniques.

Certain strategies can be used to enhance self-regulated learning and self-efficacy in students. Training workshops aimed at time management or how to study effectively can teach students how to self-regulate their learning (Purarjomandlandgrundi & Chen, 2020). In a similar sense, teachers can provide students with information on effective learning strategies (Tseng et al., 2021). This is in line with other research showing the effectiveness of self-

regulated learning strategies like “goal setting, strategic planning, time-management, and effort regulation” (Wong et al., 2021, p. 1) on learning engagement and outcome. Sitzmann and Ely (2010) demonstrated a simple way for students to engage in self-regulated learning. In their intervention, they promoted students to ask themselves questions like “Am I focusing my mental effort on the training material?”. This simple strategy increased self-regulated learning and, consequently, learning engagement by reminding students to monitor their learning (Sitzmann & Ely, 2010). Following, articles in this review found that self-efficacy can be facilitated through constructive feedback, support (Alemayehu & Chen, 2021; Barratt & Duran, 2021), and goal setting (Tseng et al., 2021). This can be explained by such practices making mastery experiences more likely and salient to students (Stephen & Rockinson-Szapkiw, 2022). Stephen and Rockinson-Szapkiw (2022) explain that the experience of mastery is an influential source of self-efficacy, acting as evidence for the student’s competencies. Indeed, an online intervention giving automatized feedback and triggering self-reflection enhanced self-efficacy and learning success (Bardach et al., 2021).

Though not studied as much as social interaction (Dolan et al., 2017), student-content interaction is also a promising way of increasing online learning engagement. A successful course design is interactive via, for instance, polls and quizzes (Purarjomandlangrudi & Chen, 2019). As students differ in the extent to which they find course materials engaging (Wilhelm-Chapin et al., 2020), teachers can increase options for students to interact with the learning material. Student-content interaction can be further facilitated by asking challenging questions, using problem-based learning strategies, and letting peers review assignments (Dolan et al., 2017). Students using generative learning strategies like summarizing or concept mapping were also reported to engage with the content more (Wilhelm-Chapin & Koszalka, 2020). When using intelligent online learning, intelligent encouragement and warning



feedback increases learning engagement. By doing so, the content is perceived as “more appealing, interactive, and emotionally supportive” to students (Sun et al., 2018, p., 1305).

### **Inhibiting Negative Factors Involved In Higher Education Online Learning Engagement**

This review showed that most learning disengagement factors, like social isolation (Dolan et al., 2017), are linked to the lack of social interaction (Barratt & Duran 2021; Dolan et al., 2017; Sun et al., 2018; Wissing et al., 2022). Thus, fostering social interactions may inhibit those learning disengagement factors. Indeed, when increasing meaningful interactions between students and teachers through practices such as in-class discussions or the use of first names, students showed higher levels of learning engagement (Dolan et al., 2017). Closely related, Kahn et al. (2016) argued that student learning engagement can be triggered by students perceiving themselves as part of a bigger student group which shares a common goal, for example, mastering the obligatory course content. Similarly, the negative relationship between online learning and learning engagement in Wissing et al.'s (2022) study was not found in students having a bigger social network and those students perceiving to have peer support. Likewise, social support was an important moderator in the relationship between psychological capital and learning engagement in Barratt and Duran's (2021) research, further underlining the importance of social relationships in learning engagement . The first step to designing a socially interactive, supportive, and appealing online learning environment was taken by Sun et al. (2018) who proposed that using intelligent feedback that is both encouraging and warning was successful at enhancing learning engagement. Taken together, practices aimed at increasing social interaction may be beneficial in doing both, fostering positive factors related to learning engagement like sense of belonging (Peacock et al., 2017) and inhibiting learning disengagement factors like isolation (Dolan et al., 2017).

To conclude, the results of this review add to the body of research on online learning engagement in students of higher education in the following ways. Firstly, it highlights the

need for facilitators of online learning environments to be aware of the differences between online and traditional learning environments. Specifically, facilitators should be aware of the negative impact that lower social interaction and higher demands for self-studying in online learning can have on students. Secondly, this framework helps guide facilitators to design online learning environments that not only mitigate or eliminate online learning disengagement factors but also foster those positively related to online learning engagement. For instance, facilitators can focus on both decreasing a sense of isolation by increasing social interaction and increasing levels of self-efficacy providing constructive feedback. Lastly, while providing a comprehensive review on various learning (dis)engagement factors, facilitators are also aided by being provided with the most prominent factors. In conclusion, when designing online learning environments, facilitators should consider fostering self-efficacy, self-regulated learning, social interaction, and sense of belonging.

#### **Limitations and suggestions for future research**

While providing a comprehensive framework on online learning engagement in students of higher education, a few limitations should be addressed. Firstly, this systematic review did not differentiate between emergency vs no emergency online learning environments. In the learning context, emergency environments are those where academic institutions were forced to move to online education, as with the COVID-19 pandemic (Saha et al., 2021). It has been suggested that such emergency settings call for different strategies to increase online learning engagement than those where online education was provided voluntarily (Abou-Khalil et al., 2021). Abou-Khalil et al. (2021), for instance, found that engagement strategies aimed at increasing student-content interaction were perceived as more effective than social interaction by students in a COVID-19, low-resource emergency setting. Resulting from the unpreparedness of moving education online, students struggled to access online course material due to slow internet connection or the lack of technologies. In Abou-

Khalil et al.'s (2021) argumentation, students in such emergency settings may, thus, have, in comparison to no emergency settings, different educational needs. As such, social interaction might only be an effective engagement strategy if proper access to course material is ensured.

Secondly, this review offers a general guide on how to effectively increase online learning engagement in HEOEs. However, there is evidence on individual differences between students. For instance, Coates (2007) notes that students differ in the extent to which they need social interaction to be engaged in their learning. Thus, future research should aim at further uncovering these individual differences and the contribution they make to our understanding of learning engagement. For example, a research design could provide students with different learning interaction opportunities. Students could be asked to choose how to study the learning material, either with their peers or with the content alone, and the effects of those learning strategies can be examined. If levels of engagement are similar, measured by, for instance, a self-report questionnaire, this might suggest that more attention should be given to students' individual differences.

### **Conclusion**

The present systematic review aimed at uncovering the factors that foster or inhibit online learning engagement in students of higher education. Among 12 articles, the identified factors were categorized as a combination of social, psychological, and cognitive factors. In line with prior research, social interaction between peers and teachers was the strongest factor, being included in 5 articles, and closely linked to sense of belonging, mentioned by 4 articles, where social interaction was demonstrated as an important practice to facilitate the need for students to belong to their social academic environment (e.g., Peacock et al.). Other important factors found were self-efficacy (3) and self-regulated learning (3), linked to increased demand for self-studying in online learners, where students high on both are better able to

study on their own (e.g., Alemayehu & Chen, 2021). Thus, facilitators in online learning environments need to give students the opportunity for social interaction with peers and teachers, foster their sense of belonging, and focus on increasing both self-efficacy and self-regulation.

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## Appendix

### Text S1 - Checklist of items to include when reporting a systematic review or meta-analysis

Section/topic	#	Checklist item	Reported on page #
<b>TITLE</b>			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
<b>ABSTRACT</b>			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	3
<b>INTRODUCTION</b>			
Rationale	3	Describe the rationale for the review in the context of what is already known.	4-9
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	5
<b>METHODS</b>			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	N/A
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	10 – 11
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	10
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	10
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	10 – 11

Section/topic	#	Checklist item	Reported on page #
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	9 – 10
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	10 – 11
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	N/A
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	12
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., $I^2$ ) for each meta-analysis.	12
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	N/A
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	N/A
<b>RESULTS</b>			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	11
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	12
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome-level assessment (see Item 12).	N/A
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group and (b) effect estimates and confidence intervals, ideally with a forest plot.	N/A
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	N/A



Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	N/A
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	N/A
<b>DISCUSSION</b>			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., health care providers, users, and policy makers).	17 – 18
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review level (e.g., incomplete retrieval of identified research, reporting bias).	26 – 27
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	27 – 28
<b>FUNDING</b>			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	N/A

