

Designing for Student Engagement in Online Higher Education: A Recent Review of Instructional Design, Interactive Pedagogies, and Learner Support

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ABSTRACT

Student engagement in online higher education involves how learners participate in course activities, interact with others and sustain their effort over time. This review examines the relationship between instructional design, interactive pedagogies and learner support through a structured Scopus search and integrative thematic synthesis of 53 publications from 2023-2026. The evidence covered fully online and distance courses, emergency remote teaching, and online components of blended or campus-based courses. Clear navigation, accessible resources and explicit expectations helped students organise independent study and enter learning activities. Learner choice and flexible formats were valuable alongside guidance that clarified assessment requirements. Engagement in active and collaborative tasks varied with their purpose, intellectual demand, sequencing and coordination. Interactive tools supported practical application and peer exchange, while unclear roles and excessive participation requirements could reduce the perceived value of activities. Timely, specific feedback and responsive facilitation were associated with progress review, self-regulation and continued involvement. Learners valued personalised communication and opportunities to contribute, which they linked to belonging and feeling heard. Teaching presence was expressed through these practices, although its direct association with engagement varied across studies. Findings on gamification and analytics-based feedback varied across engagement dimensions and academic outcomes; greater activity or higher grades did not consistently indicate stronger engagement. Work commitments, language, digital readiness and scheduling demands shaped the accessibility and perceived value of participation opportunities. Online course design should therefore coordinate clear guidance and flexible access with purposeful activities, manageable participation requirements and feedback that students can apply before the next task. Evaluating behavioural, cognitive and affective engagement alongside learning outcomes can help instructors adjust these arrangements to their learners and educational context.

Keywords: Student engagement, Online higher education, Instructional design, Interactive pedagogies, Learner support

INTRODUCTION

Student engagement in online higher education involves participation, persistence and meaningful connections with learning tasks, instructors and peers. Behavioural engagement concerns effort and participation; cognitive engagement involves investment in understanding complex ideas; and emotional engagement concerns students' feelings about learning, instructors and peers (Yildiz Durak, 2025). Online-course research also recognises social and collaborative dimensions, directing attention to relationships and shared academic work (Fanshawe et al., 2025).

Clear expectations, navigable structures and aligned assessment help learners understand how to progress. In two online teacher-education mathematics courses, Fanshawe et al. (2025) introduced orientation materials, modular resources and explicit assessment instructions. Students valued the organisation and flexibility, while access to redesigned content increased in a third-year course comparison. Seymour (2024) similarly reported positive student appraisals of accessible resources, weekly signposting and lecturer communication in a research-methods module informed by Universal Design for Learning.

Inclusive participation also depends on social and instructional conditions. Dennen et al. (2024) found that international and domestic graduate students valued clear guidelines and responsive instructors, while international students described additional linguistic and cultural demands in online discussions. Teaching presence encompasses course design, facilitation and instructional direction. Within the Community of Inquiry framework, it accompanies social presence and the construction of meaning through cognitive presence. Alshammari and Alrehaili (2025) found positive engagement associations with social and cognitive presence, whereas the direct teaching-presence association was not significant.

Flipped learning combines preparation with opportunities for discussion and application. In Guo et al.'s (2024) blended histology and embryology course, students described greater involvement after teaching was revised around preparation needs, group activity and feedback. Vilhunen et al. (2025), using ecological momentary self-reports in online climate courses, found that formulating problems and designing solutions were associated with a greater likelihood of experiencing high interest, perceived skill and challenge together.

Discussion and gamification studies distinguish activity from engagement quality. Kipling et al. (2023) found that assessed forums could become grade-focused when participation requirements outweighed their value to working learners. Cigdem et al. (2024) reported higher quiz completion in a blended engineering course without significant differences in time spent or attempts. Ojonuba et al. (2025) found higher web-development performance without significant differences in self-reported engagement or motivation.

Feedback and learner support connect learning activities with self-regulation. Morrison and Jacobsen (2023) described preservice teachers using timely, personalised feedback to recognise progress and plan revisions. In Zambian blended courses, Kangwa et al. (2024) found positive associations among teacher-scaffolded interaction, self-regulation and engagement, with partial statistical mediation through self-regulation. Yildiz Durak (2025) found higher behavioural and cognitive engagement with machine-learning-based feedback; affective engagement and academic achievement did not differ significantly between groups.

Learners' circumstances influence these practices. Salahudeen et al. (2026) identified work-life balance and time constraints among online postgraduate pharmacy learners, who valued regular feedback and flexibility. Students in Tamayo-Cano et al. (2025) rated virtual learning objects less positively than teachers despite recognising useful features. These technology-acceptance findings highlight the fit between digital resources and learner needs.

Resource-access records capture participation, interviews explain learners' experiences, and engagement scales or momentary self-reports describe other dimensions of involvement (Fanshawe et al., 2025; Vilhunen et al., 2025). A synthesis linking these findings can clarify how planned course structures relate to the activities students undertake and the support they receive over time.

This paper reviews 53 publications from 2023 to 2026 to examine how student engagement is designed and sustained in online higher education through instructional design, interactive pedagogies and learner support. Three research questions guide the synthesis:

RQ1: How do course architecture, teaching presence and inclusive instructional design shape student engagement in online higher education?

RQ2: How do active, collaborative and technology-mediated learning activities support student engagement?

RQ3: How do feedback, learner support and participation dynamics contribute to sustained engagement?

METHODOLOGY

This review used a structured literature search and integrative thematic synthesis to examine student engagement in online higher education. An integrative approach accommodates different research designs and instructional accounts addressing the same educational problem (Whittemore & Knafl, 2005). The search was conducted in Scopus on 30 March 2026 using title, abstract and keyword fields. The strategy combined terms for online and distance learning, student engagement, higher education, and instructional design, teaching practices or learner support. The search limits specified English-language articles published from 2023 to 2026, open-access status and the final publication stage. Table 1 presents the complete Scopus search strategy and limits.

Table 1: Scopus search strategy.

Scopus	TITLE-ABS-KEY ((("online learning" OR "online teaching" OR "online instruction" OR "online education" OR "virtual learning" OR "distance learning" OR "e-learning" OR elearning) AND ("student engagement" OR "learner engagement" OR "online engagement") AND ("higher education" OR universit* OR college* OR undergraduate* OR postgraduate*) AND ("instructional design" OR "course design" OR "teaching presence" OR "community of inquiry" OR feedback OR assessment OR "discussion board*" OR "discussion forum*" OR "active learning" OR "collaborative learning" OR gamif* OR "flipped classroom" OR simulation OR "team-based learning"))) AND PUBYEAR > 2022 AND PUBYEAR < 2027 AND (LIMIT-TO (OA , "all")) AND (LIMIT-TO (PUBSTAGE , "final")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English")) Date of access: 30 March 2026
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The initial search identified 1,622 records. After applying the search limits and an initial relevance check, 412 records remained for title-and-abstract screening. At this stage, 119 records were excluded because they did not match the review scope, leaving 293 records assessed for eligibility. Eligibility assessment considered topical fit and the relationship between instructional design, interactive pedagogies or learner support and student engagement in higher education. Following this assessment, 240 records were excluded and 53 publications were retained for thematic synthesis. Figure 1 summarises the study selection process. A 92-publication working pool was developed from the 293 records and refined to 53 through thematic relevance, extractable findings and distinct contributions to the synthesis. The 240 records not retained include both relevance decisions and thematic refinement. Table A1 summarises the review scope and selection.

An evidence matrix captured bibliographic details, educational setting and delivery mode, study design, participant information, instructional or support practices, engagement definitions and measures, and relevant findings. Reported engagement, behavioural participation, learner perceptions and academic outcomes were distinguished during comparison. The evidence was grouped by its substantive instructional and engagement-related contribution into three themes: course architecture, teaching presence, and inclusive instructional design; active, collaborative, and technology-mediated learning; and feedback, learner support, and engagement dynamics. Each publication received one primary thematic assignment, with cross-theme contributions recorded where relevant. Within-theme comparisons examined recurring practices, contextual differences and variation in reported outcomes. Cross-theme synthesis then considered the connections between course structure, learning activities and learner support. Mixed and contrasting findings were retained alongside positive results, with interpretation informed by the study design and the outcomes measured. Detailed extraction drew on 51 full-text publications and two abstract-level contextual contributions. The complete 53-publication evidence matrix is available upon reasonable request (see Data Availability).

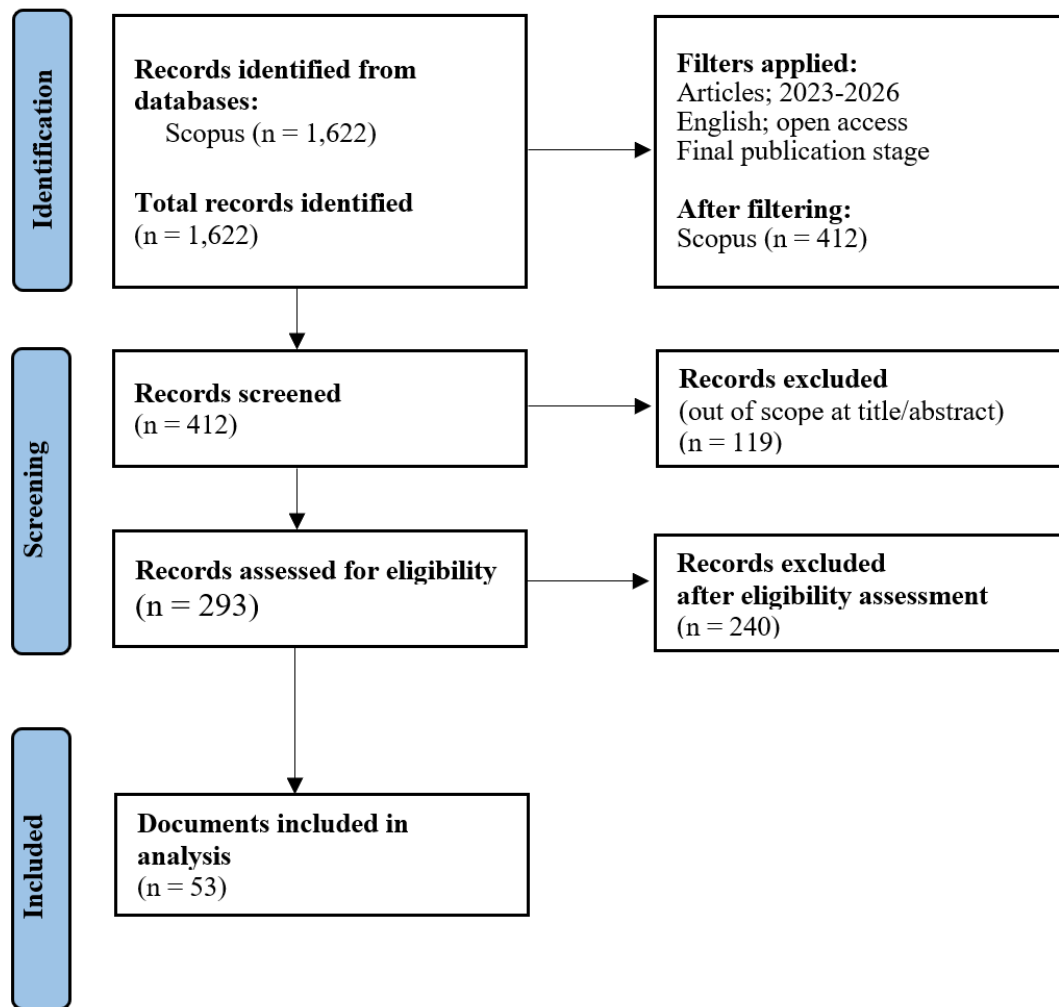


Figure 1: Study selection process.

RESULTS

The 53 publications from 2023-2026 covered undergraduate and postgraduate learning in teacher education, medicine and health sciences, engineering and computing, business, language education, and climate and sustainability education. Settings included fully online and distance courses, emergency remote teaching, and online activities embedded in blended or campus-based courses. Surveys, experimental and quasi-experimental comparisons, qualitative studies, mixed-methods evaluations and course-redesign accounts were represented. Engagement evidence included multidimensional questionnaires, resource-access and discussion records, task completion, and learners' accounts of participation. Ecological momentary self-reports captured interest, perceived skill and challenge during specific learning activities (Vilhunen et al., 2025). Faculty perspectives and instructional-design descriptions complemented the student evidence, while motivation, satisfaction and academic achievement appeared as related outcomes.

Designed distance courses emphasised flexibility and peer connection (Kipling et al., 2023), while emergency remote teaching raised adjustment and access concerns (Antonis et al., 2023; Li et al., 2023). Blended studies examined online activities within classroom-based instruction (Cigdem et al., 2024; Wang et al., 2025). Table A2 presents representative studies and their delivery contexts.

Course architecture, teaching presence, and inclusive instructional design was the primary focus of 13 publications, with attention to course organisation, accessible resources, assessment structures and instructional guidance. Active, collaborative, and technology-mediated learning formed the largest group, comprising 26 publications on flipped learning, discussion, gamification, simulation and collaborative tasks. Feedback, learner support, and engagement dynamics accounted for 14 publications addressing feedback practices, self-regulation, social interaction and learner circumstances. Assessment and feedback connected studies across these primary

groupings. Within course design, recurring concerns centred on how students located resources, interpreted expectations and obtained support.

Course architecture, teaching presence, and inclusive instructional design

Course organisation made participation more manageable when resources, learning tasks and assessment expectations were presented in clear sequences. Fanshawe et al. (2025) redesigned two online teacher-education mathematics courses using topic-centred Moodle books, short recordings, weekly guidance and practical assessment tasks. In the third-year course, average access to the first five lecture resources was 56.2% before redesign in Semester 1, 2017, compared with 91.46% access to Moodle books in Semester 1, 2018. Students' comments across course offerings emphasised clear navigation, flexible study and connections with future teaching practice.

Resource flexibility was closely connected to this organisation. In Seymour's (2024) research-methods module, all 13 postgraduate survey respondents rated the weekly preparation document as useful or very useful for identifying upcoming topics and tasks. Students also valued resource choice, accessible instructions and lecturer communication. Garrad and Nolan (2023) incorporated captioned and compressed recordings, transcripts, self-paced quizzes and assessment choices into an online inclusive-education unit. They reported higher aggregate LMS interaction after redesign, while informal feedback highlighted the value of fitting study around work and family responsibilities. These designs combined flexible access with explicit direction. Table 2 links recurring course-design findings with the conditions affecting participation and their practical implications.

Table 2: Course-design features and participation support.

Design focus	Cross-study findings and conditions	Practical implications
Orientation and weekly direction	Students valued navigable topic pages and weekly guidance for organising independent study. Higher resource access followed the complete teacher-education redesign (Seymour, 2024; Fanshawe et al., 2025).	Pair an explicit starting point with consistent weekly tasks and links to resources.
Resource format and pace	Downloadable materials and self-pacing fitted work and family schedules (Garrad & Nolan, 2023). In online English, students valued multimedia and feedback but rated resources less positively than teachers (Tamayo-Cano et al., 2025).	Offer accessible formats and flexible pacing; check resource relevance with learners.
Assessment-linked activity and choice	Students valued professionally relevant, scaffolded assessment tasks (Fanshawe et al., 2025). In gerontology, students using ungrading reported greater autonomy and attention to learning, alongside uncertainty about self-evaluation (Emerson, 2026).	Connect assessment to application and combine learner choice with guidance on judging progress.
Lecturer communication	Clear explanations and accessible guidance were valued (Seymour, 2024). Positive teaching-presence ratings coexisted with interview accounts of limited explanation and boredom (Pham & Nguyen, 2025).	Combine announcements with explanatory guidance, opportunities for questions and responses to students' work.
Peer contact and inclusion	Students valued discussion for reassurance and connection (Seymour, 2024). International learners described extra language and participation demands and valued inclusive exchanges (Dennen et al., 2024).	Use introductions and flexible discussion opportunities that welcome different experiences and allow preparation.

Inclusive design also addressed differences in how students interpreted course expectations. Dennen et al. (2024) interviewed 17 international and 10 domestic graduate students in the United States. Both groups valued clear guidelines, but international students described additional language demands, unfamiliar participation conventions and difficulty finding space for their experiences in course content. Introductions, responsive facilitation and communal help-seeking opportunities were described as supporting participation and belonging. Morgan's (2024) design account extended attention to learner variability through an asynchronous learning-

theories course combining Universal Design for Learning with workplace scenarios, assignment templates and choices of presentation tools. The proposed design connected accessible resources with realistic tasks for applying learning theory.

Assessment structure gave students different ways to demonstrate understanding and judge progress. Chandrasekaran et al. (2023) combined mathematical worksheets, simulations, quizzes, problem-based teamwork and tailored rubrics in an online information-security course. The reported proportions achieving the two highest grades were 55% in continuous assessment and 89% in the terminal examination, alongside favourable satisfaction ratings. Emerson (2026) adopted a different assessment arrangement in an asynchronous gerontology course: repeatable ungraded quizzes, reflection check-ins, written feedback, revision opportunities and student-assigned final grades. Learners described greater autonomy and attention to learning, although some experienced uncertainty about assessing their own work.

Voluntary self-assessment further showed how assessment design interacted with existing study habits. Büchele et al. (2025) examined weekly online mathematics self-assessments within a lecture-supported university course. The tasks provided corrective and interpretive feedback, with no participation marks. Regular users showed a modest estimated knowledge benefit after matching and adjustment, and accounting for wider study engagement reduced that estimate. Occasional use showed no statistically significant knowledge benefit. Engagement functioned principally as an explanatory or control variable in the analysis.

Teaching presence was expressed through planned guidance as well as the organisation of materials. In Pham and Nguyen's (2025) survey of 131 students using Microsoft Teams in Vietnam, design and organisation received the highest teaching-presence rating, with a mean of 4.40 out of 5. Interviews associated positive experiences with clear course information and explanations; some students nevertheless described limited support and boredom. Faculty perspectives emphasised similar practices. Rainchuso et al. (2026) found that graduate-course instructors rated faculty-to-learner and faculty-to-content strategies more highly than learner-to-learner strategies, particularly endorsing orientation, announcements and guided discussions. Shehzad and Charles's (2023) faculty interviews likewise emphasised relevant content, facilitation and opportunities for student voice.

Platform use and resource acceptance added another distinction. Al-Zahrani and Alasmari (2023) observed more course visits and interaction events through the Blackboard application, whereas browser access involved longer visits and more content access. These behavioural differences informed their recommendations for device-sensitive course design. In their technology-acceptance study of an online English programme, Tamayo-Cano et al. (2025) found that students rated virtual learning objects less positively than teachers, although students valued automatic feedback, multimedia and progress information. The authors interpreted the materials as more teacher-oriented.

Active, collaborative, and technology-mediated learning

Flipped and active-learning designs combined independent preparation with discussion, problem-solving and practical application. Antonis et al. (2023) used pre-class videos, individual and team readiness tests, and online group work in four computer-engineering courses during emergency remote teaching. Course-interest ratings were positive, and grades were higher in three courses than in comparison cohorts; the fourth comparison was not significant. Guo et al. (2024) reported greater learner involvement and improved chapter-specific examination performance after design-thinking-informed flipped teaching in histology and embryology, while overall course grades did not differ. Pre-class resources and collaborative application also featured in the flipped models examined by Farooqi and Naeem (2023) and Mariam et al. (2026).

In DeCaro et al.'s (2023) randomized online physics experiment, students who explored problems before instruction performed better on the subsequent test than those receiving instruction first. Asghar et al. (2023) involved medical students in an ongoing research investigation, including literature review, data analysis and scientific reporting. The 13 survey respondents rated content engagement at 87.2 on a 0-100 agreement scale; academic marks did not differ significantly across the five cohorts examined. In a distance natural-science course, Lopes (2024) found that students valued generating and discussing lesson ideas with ChatGPT, alongside

concerns about the reliability of generated information.

Discussion studies connected participation with the purpose and demands of peer exchange. Kipling et al. (2023) found that more than 70% of postgraduate respondents viewed assessed forums as well structured and positive, while 51% reported greater peer connection and 55% reported substantial subject learning. Excessive referencing and interaction requirements could encourage grade-focused participation among working learners. Mohebi's (2023) participants valued sharing experiences and encountering different perspectives on Blackboard, but also described technical and editing difficulties. Peramunugamage et al. (2024) observed stronger collaborative Moodle activity in a redesigned second cycle that simplified tasks, clarified instructions and provided examples and faster feedback.

Cui and Wang (2024) reported average weekly participation of 91% in assessed Perusall activities in an online postgraduate business course. Annotation grades and counts were positively associated with subsequent essay performance, whereas a higher proportion of follow-up annotations had a negative association. Students valued discussion but requested stronger facilitation and better-quality peer contributions. In Sherifi et al.'s (2023) online undergraduate course, PlayPosit activities aligned with group-project deliverables achieved 99.3% completion. Learners described the short videos as reusable and relevant to practical work, while group scheduling remained difficult.

Gamification findings varied with the activity and outcome measured. Suartama et al. (2024) combined case and project work with game elements in online Moodle learning. Mean post-treatment engagement scores were 90.53 in the gamified group and 79.47 in the direct e-learning group, with significant group differences in both questionnaire-based engagement and academic achievement. Cigdem et al. (2024) found a narrower pattern in online formative assessment within a blended engineering course: leaderboard users completed more quizzes, but time spent and attempts did not differ significantly. Ojonuba et al. (2025) likewise found higher web-development test performance in the gamified group without significant differences in self-reported engagement or motivation.

Reward systems could also change the form of interaction. In Pradana et al.'s (2024) sequential comparison of non-gamified and gamified online discussions, relatedness increased but replies decreased; post counts and rubric-based cognitive-engagement scores did not change significantly. Interviews suggested that likes sometimes replaced written responses. Khan et al. (2025) observed large increases in posts, replies and reactions after introducing raffle tickets for asynchronous Microsoft Teams participation in an in-person health-sciences course, compared with earlier offerings. Formal peer-feedback submissions remained absent. Subiyantoro et al. (2024) reported descriptive engagement increases from 77.8% to 91.43% with a gamified LMS, compared with 71.9% to 75% in the control class. Rahimipour et al. (2025) documented substantial platform uptake and positive enjoyment ratings in gamified online embryology, alongside higher examination scores than the historical routine-teaching cohort.

Simulation and clinical scenarios offered opportunities to apply disciplinary knowledge. Chen et al. (2024) compared BOPPPS-guided virtual simulation with traditional preventive-medicine experimental teaching. The simulation group scored higher for learning-method and emotional engagement, while total engagement, participation and manifestation scores did not differ significantly. Experimental-report performance also favoured simulation. In Chan et al.'s (2025) interprofessional programme, engagement scores increased after asynchronous gamified case activities and remained elevated following synchronous discussion with VR360 clinical videos. The additional increase after the VR360 stage was not significant. Students nevertheless valued guided exchanges across professions and cultures.

Practical activities combined digital demonstrations with opportunities for rehearsal. Ebrahim et al. (2024) used household materials and video submissions for online surgical knot-tying; all 71 participants submitted attempts, and focus groups valued self-paced practice while requesting more direct supervision. Wang et al. (2025) combined a small private online course (SPOC) with offline evaluative group learning in dentistry. Interaction and applied assessment performance favoured this blended approach, while basic-knowledge scores did not differ significantly. In biology, Lacey et al. (2024) found the most favourable branched-video responses when the videos supported scaffolded problem-solving and consolidation. Perceived engagement was positive,

although learning gains did not exceed those from linear videos.

Vilhunen et al. (2025) sampled online climate-course experiences through ecological momentary self-reports. Figure 2 shows descriptive proportions of optimal learning moments: 44.3% during solution design and 39.0% during problem formulation and ideation, compared with 18.7% during lectures. In the adjusted analysis, solution design and problem formulation were associated with higher engagement odds, whereas general collaboration was not a significant predictor.

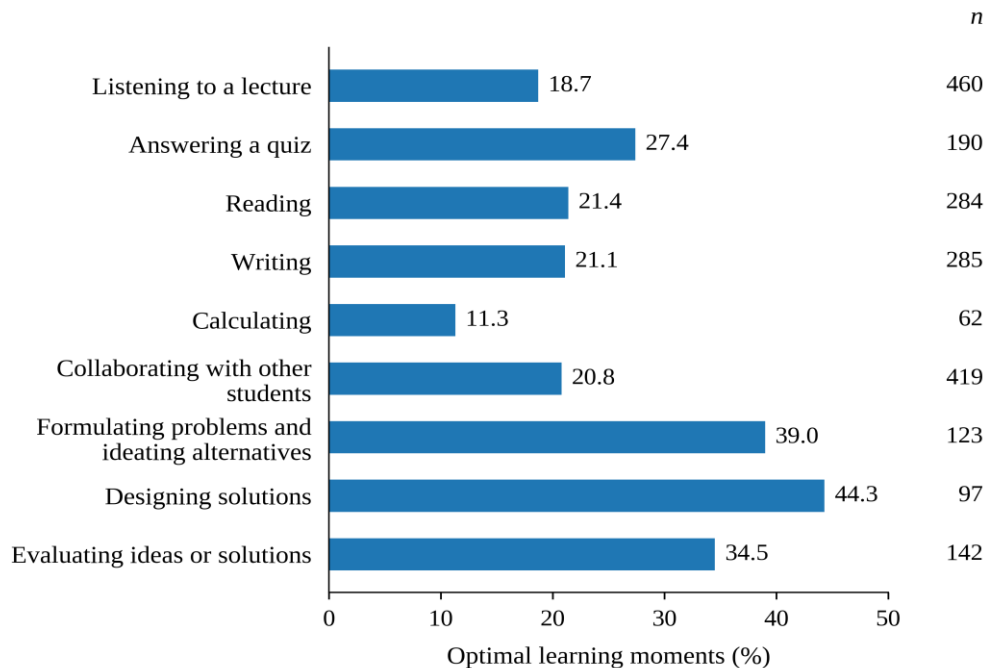


Figure 2: Situational engagement across learning activities. Replotted from Vilhunen et al. (2025)

Zulpykhar et al. (2026) followed a single group of 31 undergraduates over 15 weeks of coursework using Google Workspace, Microsoft Teams and Miro. Effective contribution averaged 4.00 out of 5, while productivity averaged 3.06 and did not differ significantly from the neutral midpoint of 3 (one-sample $p = .730$). Students valued connected teamwork but requested clearer roles, task tracking and schedules. Across these activity designs, meaningful application and visible contribution were recurrent benefits, while task demands, interaction quality and coordination shaped how students participated.

Feedback, learner support, and engagement dynamics

Timely, specific and personalised feedback helped students recognise progress and prepare for subsequent work. Morrison and Jacobsen (2023) examined an online teacher-education course through student coursework, teaching-team conversations and interviews with three preservice teachers and a co-instructor. Feedback on weekly reflections, usually returned within one to three days, enabled students to make revisions before discussion and identify ideas requiring further attention. Students described strengths-based comments as motivating and valued knowing that the instructor had read their work carefully. Questions within the feedback encouraged reflection and deeper exploration, connecting the instructor's responses with students' planning, self-assessment and continued participation.

Analytics-based feedback produced a more differentiated pattern across engagement dimensions. In Yildiz Durak's (2025) 14-week online collaborative course, feedback cards drew on profiles of system use, course visits and task completion. Adjusted post-test comparisons favoured the feedback group for behavioural and cognitive engagement, while affective engagement and academic achievement did not differ significantly between groups. Yunus and Bachtiar (2025) examined postgraduate distance learning through questionnaires and interviews. Among 75 respondents, 72 agreed or strongly agreed that instructor feedback was specific and actionable. Interviewees described frequent small assessments and feedback as helping them monitor progress, although some feedback arrived after students had progressed to the next assignment. Table 3 compares these feedback practices and their engagement-related outcomes.

Table 3: Feedback practices and engagement-related outcomes.

Support focus	Online teacher-education course Yildiz Durak (2025)	Postgraduate distance learning Yunus and Bachtiar (2025)
Feedback timing	Activity-based feedback cards were issued in weeks 5, 8, 11 and 13 of a 14-week online course.	66/75 respondents agreed or strongly agreed that feedback was timely and constructive. Interviews also described occasions when feedback arrived after the next task.
Actionable guidance	Feedback drew on activity profiles based on time in the system, course visits and task completion, with guidance for maintaining or improving participation.	72/75 respondents agreed or strongly agreed that instructor feedback was specific and actionable.
Reviewing progress	Students could view individual and group performance and revise uploaded work before the deadline.	71/75 respondents agreed or strongly agreed that opportunities for self-assessment were available to track progress.
Engagement response	Adjusted post-test comparisons favoured the feedback group for behavioural engagement ($p = .012$) and cognitive engagement ($p = .025$).	Interviewees described frequent low-stakes assessments and feedback as helping them stay on track and adjust their work.
Affective and academic outcomes	Between-group differences were not statistically significant for affective engagement ($p = .557$) or academic achievement ($p = .635$).	Students described lower assessment anxiety and perceived learning benefits.

Note. Yildiz Durak (2025): 26 feedback-group and 23 comparison-group students; comparisons adjusted for pre-test scores. Yunus and Bachtiar (2025): 75 questionnaire respondents and 12 interviewees.

Self-regulation connected instructor support with students' management of their own learning. Kangwa et al. (2024) found direct and indirect associations between teacher-scaffolded online interaction and engagement among 1,323 undergraduates in Zambian blended-learning settings, with self-regulation partially mediating the relationship. The cross-sectional model explained 51% of the variance in engagement. Feedback also operated in the opposite direction when students evaluated teaching. In a survey of 222 international students in Hungary, Rudnák et al. (2024) found that teaching effectiveness statistically mediated the association between students' feedback about online classes and engagement. The direct association became non-significant with teaching effectiveness included.

Responsive facilitation gave online participation a social dimension. Brown et al. (2023) examined live laboratory and field broadcasts at a distance-learning university. Across 14 broadcasts, 71-100% of live viewers completed at least one widget action or chat contribution. Moderators invited responses, relayed questions and provided guidance, while praise, humour and reassurance featured in the communication strategies. Learner accounts valued opportunities to follow scientific reasoning and contribute during practical investigations. Pujasari et al. (2025) reported related experiences in an online English-education course: six active Canvas participants described personalised communication, warm-up activities and lecturer responses as helping them feel heard and more willing to interact. Interviews, observations and course materials connected these practices with emotional engagement and peer belonging.

Social connection and cognitive involvement also emerged in survey models. Alshammari and Alrehaili (2025) analysed responses from 220 students in Saudi online courses and found positive associations between engagement and social and cognitive presence. The direct teaching-presence path was not statistically significant. In Wilkins et al.'s (2023) survey of 664 higher-education students in the United States, technology readiness, social identification and intercultural communication competence were positively associated with

purposeful interpersonal interaction in breakout rooms. Extroversion was not a significant predictor. Purposeful interaction was, in turn, associated with perceived learning.

Participation patterns varied across time and task conditions. Hoffman et al. (2023) analysed activity records from 438 students in an asynchronous competency-based course. Assessment-submission timing predicted final grades across initial, deadline-driven and no-deadline lessons, whereas regularity was a significant predictor for deadline-driven lessons. Page-view frequency predicted grades for no-deadline lessons, but the highest-performing students viewed those pages less often than lower-performing students. Greater activity volume therefore did not consistently accompany higher performance. Kumi (2023) added a relational perspective through social network analysis of discussion-forum interactions, identifying students' social positions and the strength of their ties. Timing and relational patterns captured aspects of participation beyond aggregate activity counts.

Learner characteristics and study conditions shaped engagement alongside instructional support. Using a Community of Inquiry-informed framework, Li et al. (2023) surveyed 351 undergraduates who had experienced emergency online teaching in the United States. Digital skills, time management, health, sense of community and instructor nonverbal immediacy were positively associated with self-reported engagement. Engagement was also associated with perceived learning. Open-ended responses described home distractions, screen fatigue, unstable connections and difficulty reaching instructors.

Professional commitments were particularly prominent in postgraduate settings. Salahudeen et al. (2026) surveyed 114 current students and recent graduates of an online clinical-pharmacy programme. Work-life balance and time constraints were the leading barriers; regular instructor feedback was the most frequently endorsed improvement strategy, at 85.1%, while satisfaction with opportunities for peer interaction was 28.9%. Respondents requested staggered deadlines, mentor-style support and real-time case discussions. In Indonesian distance science practicum, Widiasih et al. (2025) similarly reported variation in engagement by tutorial modality, employment status and residential area, with higher engagement among students receiving consistent feedback. Across these settings, learners valued support that combined timely academic guidance with opportunities for connection and flexibility around their circumstances.

DISCUSSION

Online engagement is shaped by the fit between course structure, learning activity and students' circumstances. Clear routes into a course make participation manageable, while purposeful tasks provide opportunities for application and exchange. Feedback and responsive facilitation help learners interpret progress and sustain involvement (Fanshawe et al., 2025; Morrison & Jacobsen, 2023).

Structure, choice and meaningful activity

Weekly guidance and resource choice helped students organise independent study in Seymour's (2024) research-methods module, while clear participation guidelines were particularly valuable to international learners in Dennen et al. (2024). In contrast, Kipling et al. (2023) found that detailed assessment requirements could make postgraduate forums feel procedural and grade-focused. The practical distinction concerns what structure enables: instructions can clarify the task and its purpose while leaving students room to select examples, develop explanations and contribute from their own experience. The amount of prescribed interaction should reflect the learning task and the time needed for thoughtful exchange.

The intellectual work within an activity was also consequential. Vilhunen et al. (2025) associated problem formulation and solution design with situational engagement, whereas general collaboration was not a significant predictor. Lacey et al. (2024) found the most favourable responses to branched video when it supported scaffolded problem-solving after core instruction. These findings place task purpose and sequencing alongside interactivity. The coordination problems reported by Zulpykhar et al. (2026) extend this interpretation to teamwork: shared tools provide places to contribute, but learners also need agreed responsibilities, manageable schedules and a clear connection between individual contributions and the group task.

Feedback, connection and continued participation

Feedback connected learning activity with opportunities to review and adjust subsequent work. Morrison and Jacobsen (2023) described students using personalised comments to plan revisions and recognise progress. Kangwa et al. (2024) found statistical mediation through self-regulation in the association between teacher-scaffolded interaction and engagement. Together, the qualitative accounts and observational model suggest that guidance and learner autonomy can operate jointly: support gives students information they can use to manage their own work. Its timing matters in relation to the next task, as illustrated by the contrast between positive feedback appraisals and accounts of delayed responses in Yunus and Bachtiar (2025).

Social connection added a relational dimension to that guidance. Pujasari et al. (2025) linked thoughtful lecturer responses and opportunities for expression with students' feelings of being heard, while Dennen et al. (2024) showed how language and unfamiliar participation conventions shaped belonging. Alshammari and Alrehaili (2025) found positive social- and cognitive-presence associations with engagement, alongside a non-significant direct teaching-presence path. Instructional planning should pair guidance with opportunities for students to express uncertainty, exchange ideas and receive a response to their contributions. The value of presence lies partly in how students experience those exchanges.

Support also needs to fit the conditions in which students study. Li et al. (2023) associated digital skills, time management and community with engagement during emergency online teaching. Salahudeen et al. (2026) identified work commitments and time constraints alongside demand for regular feedback and flexible arrangements among postgraduate pharmacy learners. Scheduling and workload therefore belong within instructional planning. Opportunities for discussion become more usable when students can anticipate their timing, prepare contributions and obtain guidance compatible with their other responsibilities.

The proposed cycle of designed engagement links course architecture, interactive pedagogy, feedback and self-regulation through continuing instructional facilitation (Figure 3). Learners' progress and responses inform guidance and adjustments to the learning environment, connecting participation with ongoing course design.

The cycle links the course-design findings in Theme 1, activity comparisons in Theme 2, and support processes in Theme 3. Table A2 summarises the thematic evidence informing the proposed cycle. Community of Inquiry addresses cognitive, social and teaching presence (Garrison et al., 2000), while Zimmerman (2002) describes forethought, performance and self-reflection. The cycle brings these perspectives into course and task decisions, with access, workload, language and coordination shaping participation. It is a practice-oriented conceptual synthesis whose combined relationships remain to be tested.

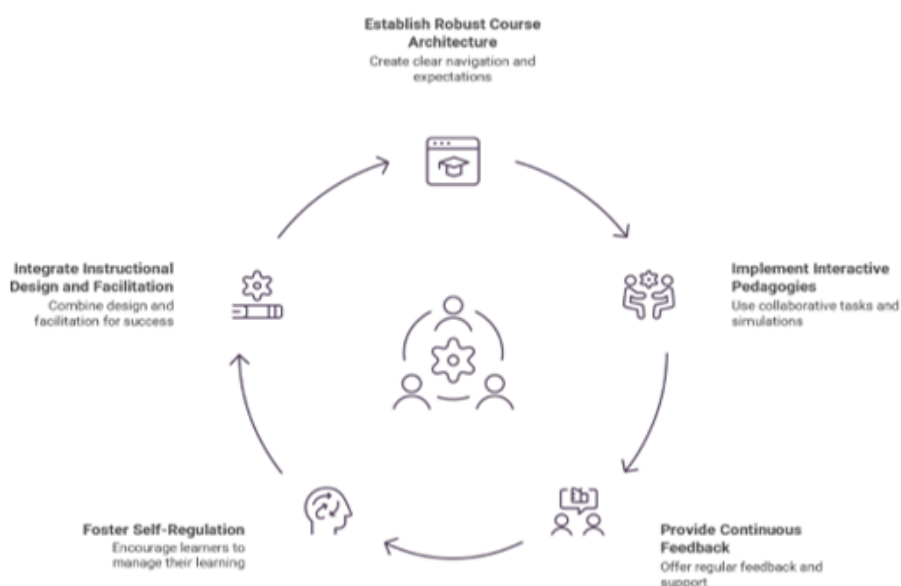


Figure 3: Cycle of designed engagement in online higher education.

Engagement dimensions and learning outcomes

Changes in one aspect of participation did not consistently extend to other outcomes. Cigdem et al. (2024) found higher quiz completion without significant differences in time spent or attempts, while Pradana et al. (2024) found increased relatedness alongside fewer replies. Hoffman et al.'s (2023) page-view analysis similarly showed that activity frequency had different relationships with grades across task types. Activity records are consequently more informative when interpreted with task requirements and learners' accounts of how they worked. A completed quiz, a written reply and a social connection represent distinct contributions to participation.

Engagement and achievement also followed different patterns. Ojonuba et al. (2025) reported higher test performance without a significant self-reported engagement difference, whereas Yildiz Durak (2025) found behavioural and cognitive engagement differences without a significant academic-achievement difference. These comparisons favour evaluating the intended engagement dimension alongside a relevant learning outcome.

Limitations

Interpretation depends on study design, engagement measurement and observation period. Course redesigns evaluated several features together, while questionnaires and platform records captured different aspects of participation. Findings from individual courses and observational models describe their particular settings and associations. Longer-term persistence and transfer across courses remain uncertain (Fanshawe et al., 2025; Yildiz Durak, 2025).

The single Scopus search and English-language, open-access restrictions may underrepresent relevant research and introduce selection bias. The 2023-2026 window provides partial 2026 coverage up to 30 March, with possible indexing delays. Publication and selective-reporting biases may favour positive findings, while thematic refinement involves selection judgement. Differences in infrastructure, course purpose and learner circumstances limit transfer across designed online, blended and emergency remote settings.

Implications for course design

Course planning should connect each activity to a clear purpose, an achievable participation requirement and an opportunity to receive and use feedback. The practices in Table 2 offer concrete starting points through orientation, weekly direction and accessible resources; Table 3 connects feedback with progress review. In collaborative work, agreed roles and task tracking address the coordination difficulties described by Zulpykhar et al. (2026). Feedback schedules should allow revision before the next task, following the learner experiences reported by Morrison and Jacobsen (2023).

Technology selection should begin with the learning function required, such as rehearsal, co-authoring or progress review. Tamayo-Cano et al.'s (2025) teacher-student differences in resource acceptance make learner input particularly relevant to that choice. Combining task evidence with students' accounts provides a practical basis for adjusting workload, communication and resource formats while retaining the intended intellectual demand.

Future Research Agenda

Longitudinal and comparative studies should test how course organisation, task design and support relate to engagement over successive learning activities. Fanshawe et al. (2025) linked course redesign with greater resource access, while Kangwa et al. (2024) identified associations among instructor scaffolding, self-regulation and engagement. Comparable course groups could vary a specific design feature while retaining the same content and assessment demands. Repeated measures of participation, feedback use and self-regulation would allow the proposed relationships in Figure 3 to be examined over time, including whether early engagement persists in later modules.

Feedback comparisons should examine both delivery and use. Morrison and Jacobsen (2023) described learners

applying personalised comments to subsequent work, while Yildiz Durak (2025) found different responses across engagement and academic outcomes. Studies could compare instructor, peer, automated and analytics-based feedback on equivalent tasks, documenting response timing, specificity and opportunities for revision. Linking feedback access to changes in submitted work and later participation could distinguish receipt from uptake. Comparisons should also examine whether feedback provided before the next activity supports behavioural, cognitive and affective engagement differently from feedback received after that activity.

Measurement should capture the quality and timing of participation alongside students' experiences. Pradana et al.'s (2024) finding of greater relatedness with fewer replies illustrates the value of examining engagement dimensions separately. Studies could combine multidimensional engagement scales with activity records, coded discussion contributions and learner interviews. Ecological momentary self-reports, as used by Vilhunen et al. (2025), could locate changes within particular tasks. Motivation, satisfaction and perceived learning should remain separate outcomes from engagement and assessed academic performance. Following the same learners across activities could clarify how changes in participation and engagement relate to later learning outcomes.

Transfer across settings requires comparisons that account for learner circumstances. The language and participation demands described by Dennen et al. (2024), together with the work and scheduling constraints identified by Salahudeen et al. (2026), suggest examining who benefits from particular forms of flexibility and support. Studies across institutions could compare similar activities while documenting employment, language background, digital readiness, connectivity and coordination demands. Fully online courses and online components of blended courses should be analysed separately. Repeated learner accounts and participation records could help explain differences in feedback use, belonging and sustained involvement across these contexts.

CONCLUSION

This review examined student engagement in online higher education across 53 publications on instructional design, interactive pedagogies and learner support. Clear course organisation, accessible resources and explicit expectations helped students enter and navigate learning activities. The value of active and collaborative approaches depended on task purpose, intellectual demand, sequencing and the coordination of individual and group contributions. Timely, specific feedback and responsive facilitation were associated with progress review, self-regulation and continued involvement. Learners also valued opportunities to express uncertainty and receive responses to their work. These relationships connect inclusive course design with meaningful activity and support that students can use as their learning progresses.

Learner circumstances shaped both access to participation opportunities and their perceived value. Work commitments, language, digital readiness and scheduling demands influenced how students managed learning and sought support. Behavioural, cognitive and affective engagement showed different responses to instructional approaches, and engagement gains did not consistently coincide with improved academic performance. Course evaluation should therefore consider the intended engagement dimension alongside learning outcomes and students' experiences. The practical priority is to align clear guidance and flexible access with tasks that invite substantive contribution. Instructors can support this alignment by setting manageable participation requirements and providing feedback early enough for students to apply it to the next learning task.

Data Availability

The complete 53-publication evidence matrix and thematic coding records are available from the corresponding author, Ahmad Fadzil Jobli (ahmad151@uitm.edu.my), upon reasonable request.

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Appendix: Review Scope and Thematic Evidence

Table A1: Review scope and selection summary.

Review element	Summary
Search coverage	Scopus, searched on 30 March 2026; publication window 2023-2026, with 2026 coverage to the search date.
Publication limits	English-language journal articles at the final publication stage, returned by the Scopus open-access filter.
Selection sequence	1,622 records identified; 412 remained after limits and preliminary filtering; 293 remained after 119 screening exclusions; 53 were retained for synthesis. The 240 not retained after the 293-record stage include relevance decisions and thematic refinement.
Working pool and final retention	The 293-record set yielded a 92-publication working pool. Final retention prioritised thematic relevance, extractable findings and distinct contributions, producing the 53-publication analytical set.
Evidence basis	Detailed extraction covered 51 full-text publications. Kumi (2023) and Widiasih et al. (2025) contributed contextual evidence from abstracts.
Evidence-matrix fields	Setting, discipline, student level, sample, study design, delivery mode, instructional approach, engagement definitions and measures, principal findings, and relevant study limitations.

Table A2: Thematic evidence summary.

Theme and primary count	Representative studies and contexts	Principal findings and conditions	Proposed cycle connection
Course architecture, teaching presence, and inclusive instructional design 13 publications	Fanshawe et al. (2025): designed online teacher-education mathematics. Seymour (2024): redesigned online postgraduate research methods.	Learners valued clear navigation, weekly guidance and flexible resources. Greater resource access accompanied the complete Fanshawe redesign; Seymour reported students' appraisals of the module.	Course organisation supports entry into activities; learner responses can inform revisions to guidance and resources.
Active, collaborative, and technology-mediated learning 26 publications	Vilhunen et al. (2025): fully online climate courses. Cigdem et al. (2024): blended engineering. Antonis et al. (2023): emergency remote engineering.	Vilhunen associated problem formulation and solution design with situational engagement. Cigdem found more quiz completions, but no significant time or attempt differences. Antonis reported positive interest and higher grades in three of four courses.	Task purpose and participation conditions inform activity design. Learners' contributions provide opportunities for feedback.
Feedback, learner support, and engagement dynamics 14 publications	Morrison and Jacobsen (2023): fully online teacher education. Yildiz Durak (2025): online collaborative education. Yunus and Bachtiar (2025): designed postgraduate distance learning.	Morrison and Jacobsen linked feedback use to revision and planning in learner accounts. Yildiz Durak found higher behavioural and cognitive engagement with feedback, but no significant affective or achievement differences. Yunus and Bachtiar reported positive appraisals of actionable feedback alongside delays.	Usable feedback connects progress review, self-regulation and continued facilitation; its timing affects opportunities to apply it.