A Systematic Literature Review of Online Academic Student Support in Higher Education

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Abstract
COVID-19 led to an increase in online higher education courses. With this increase in demand, there needs to be online support to foster students' academic success. Online academic student support is often provided to students to assist them in developing the skills and knowledge to successfully complete their courses. However, it remains unclear whether online academic student support in higher education is successful, and if so, what makes it successful. This systematic literature review seeks to provide an overview of research on online academic student support in higher education. Out of 5385 initially identified publications from 2013 to 2022, 12 papers were included for review; seven studies were quantitative and five were mixed-methods studies. The synthesis of the findings reported outcomes on students' improved engagement, access to support and usage patterns, satisfaction, academic performance, motivation, creativity, self-efficacy, retention or course completion, and social benefits. This range creates a challenge for higher education providers who consider implementing best practice in the provision of online academic student support due to the diversity of approaches. Future research that is methodologically strong is needed to demonstrate the impact of online academic student support detailing how higher education providers can improve the quality, learning outcomes, and retention of students.

Keywords: Online higher education, online academic student support, systematic review

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The rapid, global pivot to online educational delivery in higher education because of the COVID-19 pandemic was both abrupt and unprecedented (Dhawan, 2020; Hume & Griffin, 2022; Lee et al., 2022; Martin, 2020; Organisation for Economic Co-operation and Development, 2020). Critically, this pivot happened at a time when many providers were struggling to deliver high-quality online educational experiences to students and experiencing higher attrition rates for online courses compared to on-campus (Delnoij et al., 2020; Roddy et al., 2017). The scale of the rapid change and the need to digitise teaching, learning, and vocational training has transformed these sectors for the foreseeable future (García-Morales et al., 2021; Hume & Griffin, 2021; Lockee, 2021). Post-COVID-19, the widespread acceptance of online study has led providers to reimagine how online teaching and learning can be delivered (Croucher & Locke, 2020) with new models of personalised and responsive academic student support available at a point of need (Rotar, 2022; Walsh et al., 2020).

Globally, higher education providers have struggled to provide high-quality online education that incorporates instructional and experimental design features (Chen et al., 2021; Morris & König, 2020) that lead to positive student-level outcomes, including constructive student interpersonal interactions with academics and other students, personalised learning environments, and highly responsive student support (Bernard et al., 2009; Jaggars & Xu, 2016; Kim & Thayne, 2015; Thistoll & Yates, 2016; Walsh et al., 2020). As a result, high attrition (Haydarov et al., 2013; Moore & Greenland, 2017; Oregon et al., 2018; Patterson & McFadden, 2009; Simpson, 2012) and low student completion rates (Li & Wong, 2019) remain a challenge for the sector.

Historically and currently, attrition rates are high for online students when compared to on-campus students across higher education (Billett et al., 2020; Boton & Gregory, 2015; Grau-Valldosera et al., 2018; Greenland & Moore, 2014; Hall & Harvey, 2021; Kember et al., 2023; Moore & Greenland, 2017; Nieuwoudt, 2020). High attrition rates represent a substantial revenue loss for providers (Greenland & Moore, 2022) and providers face an adaptive and transformative challenge to better understand how to provide effective practices of facilitating online academic student support that improves student academic outcomes and leads to a reduction in attrition rates. To facilitate a timely and responsive approach to the successful delivery of online academic student support in higher education, this systematic literature review synthesises research over the last ten years on the effectiveness of online academic student support and provides an evidence-based overview of reported practices that result in productive learning outcomes in online higher education and new directions for future research.

The paper is structured as follows. The background provides an overview of online academic student support, of its need and value, and of the theoretical constructs that justify this review. The methods section describes the procedure for conducting this review, including the data selection process and the methodological steps followed to analyse the quality of the selected papers. The results section is structured according to the research questions to present the findings, categorisations, and analysis of data. The discussion summarizes evidence and identifies research gaps and limitations, and the conclusion makes suggestions for future research that explores new ways to incorporate online academic student support into the provision of higher education.

Background

An extensive desktop scoping search was conducted to establish whether a systematic literature review on online academic student support in higher education, including vocational education, was warranted. Existing literature reviews of online academic student support vary in terms of methodology and focus. Ardekani et al. (2021) conducted a literature review on academic and mental health support systems for undergraduate medical students during the COVID-19 pandemic. While students and faculty members seemed receptive to new systems of support, most of the ten included studies provided program descriptions rather than evaluations. A systematic review by Gray and Crosta (2019) on best practices in online doctoral supervision identified the following three themes that affected the perceived quality of supervision: enculturation, emancipation, and healthy relationships. The perspectives were mined from 100+ studies of online and face-to-face supervision and included varying qualitative and quantitative study designs and 16 literature reviews. Muljana and Luo's (2019) "systematic literature review investigated the underlying factors that influenced the gap between the popularity of online learning and its completion rate" (p. 19). Their findings revealed several aspects of online learning experiences that affected retention. The student retention strategies Muljana and Luo put forth included "early interventions, at-all-times support for students, effective communication, support for faculty teaching online classes, high-quality instructional feedback and strategies, guidance to foster positive behavioural characteristics, and collaboration" (p. 20). A scoping review by Tan et al. (2021) examined 61 articles for student perspectives towards online instruction and found that students' positive and negative perceptions were strongly related to "quality instruction, online interaction, and instructional and technical support" (p. 1). Other reviews focused on artificial intelligence (AI) application in higher education (Zawacki-Richter et al., 2019) or learning analytics benefits, challenges, and efficacy (Knobbout & Van Der Stappen, 2020; Sønderlund et al., 2019).

Methodologically, some of these reviews lacked scientific rigour. Critically, none of the reviews included a thorough quality appraisal with validated appraisal tools to ensure conclusions were drawn from high-quality scientific research. Given the findings of our scoping search and the scale and speed with which higher education courses moved online because of the COVID-19 pandemic—caught many educational institutions off guard—this systematic review is warranted because it provides an overview of the most recent best-practice evidence on online academic student support in higher education settings. Further, it provides an appraisal of the quality of the included studies to ensure conclusions were drawn only from methodologically sound studies. The following research questions were asked:

RQ1. What are the key characteristics of the studies included in the review?

RQ2. What student outcomes are reported across the studies included in this review, and how do they vary across different types of student support?

RQ3. What is the methodological design quality of the included studies as assessed by the Critical Appraisal Skills Programme (CASP) and the Effective Public Health Practice Project (EPHPP) quality appraisal tools?

Definition and Scope of Online Academic Student Support in Online Higher Education

In this systematic literature review, online higher education is defined as post-secondary education provided by universities (undergraduate and postgraduate levels), vocational education providers (certificate, diploma, and bachelor's degree levels), and other education providers (e.g., business schools and niche providers that offer accredited courses). Online academic student support, for the purpose of this review, is tightly focused on online academic support services. Our definition of online academic student support is grounded in an e-learning systems theory framework (Aparicio et al., 2016)) that identifies people, technologies, and services. "Services are considered here as the main output, as they operationalize instructional strategies and several pedagogical models" (p. 302) Online academic support services are designed to assist students with their assignments, facilitate their learning, guide them in finding study resources, and help them develop new skills. While these online services can complement the learning support already embedded in the curriculum, they can be delivered both synchronously (in real-time) and asynchronously (not in real-time, such as through pre-recorded materials or resources). Other approaches to supporting students may come from mechanisms such as heuristics in the Customer Relationship Management (CRM) systems that use learning analytics to prompt academics to reach out to students (Walsh et al., 2020), learning management systems (LMS), and artificial intelligence (AI).

Methods

Before commencing the systematic review, a research protocol was established, circulated among all authors, and discussed until consensus was achieved. The inclusion / exclusion criteria as described in the protocol were adjusted in February 2023 to better manage the large volume of search results. The refined criteria are described in the next section.

Inclusion Criteria

Included were peer-reviewed journal articles that focused on models of student support in higher education settings, published between 2013 and 2022, in the English language. We included publications on educational trials, program/intervention evaluations, case studies, and research reports. Papers with student and teacher outcomes were included where the predominant focus was on students. Papers on student experiences were included where they focused on the online support received and not general online learning experiences. Support provided via social networking sites was included if the support was formalised through the higher education provider.

Exclusion Criteria

Papers were excluded if their focus was on informal learning groups, computer-assisted learning (CAL), blended learning, hybrid learning, flipped classroom, or exclusively face-to-face learning support. Theoretical and descriptive papers were excluded due to the absence of data and tangible real-world outcomes. This decision ensures that our analysis remains methodologically consistent and directly applicable to higher education settings, thereby enhancing the robustness and relevance of our findings. Exclusion criteria were carefully chosen to prioritise data-driven evidence and to maintain the study's practicality.

Search Strategy

The Population, Intervention, Comparison and Outcomes (PICO) tool (Methley et al., 2014) was utilised to establish and organise the main concepts underpinning the research questions and, together with an expert librarian in the field of education, we meticulously developed a comprehensive and well-structured search strategy. This strategy was designed to ensure that our literature search would be thorough, effective, and aligned with the identified research questions.

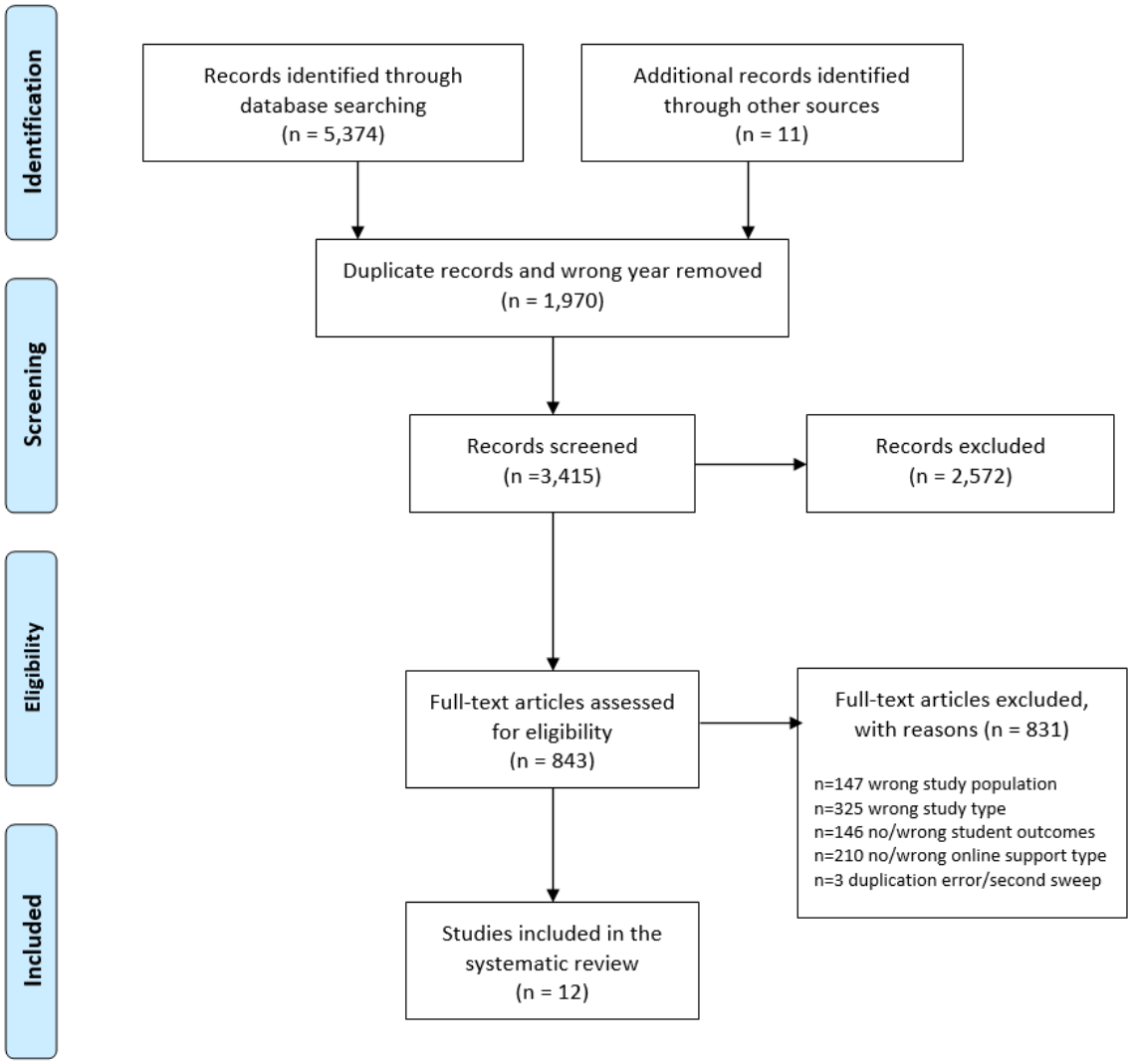
Sources for the national and international peer-reviewed literature included Emerald Insight, Academic Search Elite, ERIC ProQuest, Informit A+ Education, SAGE, Scopus, Web of Science, EBSCO, and Google Scholar. Databases were searched with the terms below. Search strings consisted of these terms in different variations to accommodate database specific requirements and sensitivities:

- higher education OR vocational education OR adult education OR adult learning
- online support OR online student support OR online learning support OR online student learning support OR online support models OR online academic support
- responsive OR responsive learning environments OR online higher education learning environments
- learning analytics OR artificial intelligence (AI) OR learning management system OR LMS

Sources for grey literature included government and non-government organisations, and education service provider websites. To complete the exploration, a hand search of reference lists of relevant literature was performed. Initial searches were completed in May 2022 and updated in February 2023.

Figure 1

Preferred Reporting Items for Systematic Reviews and Meta-Analyses [PRISMA] Flow Diagram



Data Management

One author performed all searches and exported the results into the referencing management software program, EndNote X9. Duplicates and any papers published outside the range of years were removed. All steps of this process were documented in an Excel spreadsheet to ensure transparency and replicability. Once this process was completed, all items were exported into SysRev, a web-based data curation platform (Bozada Jr et al., 2021) to begin the collaborative processes of screening and data extraction.

Study Selection

The process used for the study selection is detailed in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses [PRISMA] Flow Diagram (Figure 1) (Page et al., 2021). The same author who undertook all searches assumed the first step of the study selection process, which comprised the screening of titles and, if necessary, abstracts, to determine relevance. The remaining papers were divided equally among the five authors. The second step of the screening process was strictly guided by a list of pre-defined inclusion criteria. Each item was independently screened by two different reviewers to determine eligibility against the inclusion criteria. Any conflicts were resolved through discussion among the authors until consensus was achieved. In a small number of cases, a third author was consulted to arbitrate.

Data Extraction and Analysis

Time and resource constraints necessitated that data extraction be largely conducted by one author; however, to ensure high-quality systematic review practices, we satisfied the Cochrane Collaboration recommendations in these circumstances (Higgins et al., 2022) by having the data of the reported outcomes extracted by two independent reviewers. In cases where results differed, a discussion followed until consensus was achieved. The study characteristics are presented and described in tabular form (Appendix 1) followed by thematic analysis.

Study Quality Appraisal

Two different tools were utilised to assess the methodological quality of the quantitative and mixed methods studies. All studies were assessed with the Effective Public Health Practice Project (2009) (EPHPP) Quality Assessment Tool for Quantitative Studies. While initially developed for the evaluation of studies in health research, this tool (plus its accompanying dictionary) was chosen for its comprehensive set of design components which are equally relevant in education research studies: selection bias, study design, confounders, blinding, data collection methods, withdrawals and dropouts, intervention integrity, and analyses. The qualitative components of the mixed-methods studies were subjected to the Critical Appraisal Skills Programme (2018) (CASP) Qualitative Research Checklist. The CASP tool assesses the applicability, reliability, and validity of published qualitative research, according to a series of ten questions concerned with the aim of the research, methodology, research design, recruitment strategy, data collection, relationships between researcher and participants, ethical considerations, data analysis, findings, and the value of the research. The methodological quality of the included studies was independently assessed by all five authors; each study was assessed by two reviewers. Results were compared and discussed until consensus was achieved.

Results

Combined searches yielded a total of 5385 records. After the removal of duplicates and irrelevant items, 839 records remained for full-text assessment, of which 12 studies met the inclusion criteria. Reasons for exclusion included studies focused on the wrong study population (teachers, wrong age group, primary or secondary students, etc.) (n=147), wrong study type (conference papers and reports without student outcomes, opinion pieces, news articles, program descriptions, conceptual papers, papers on course design, etc.) (n=325), reported no or the wrong student outcomes (papers on support seeking behaviour, perceptions about online social presence, needs analyses, etc.) (n=146) either did not focus on online support or focused on the

wrong support type (online learning material offered, informal learning groups, support offered in blended learning or flipped classroom mode, etc.) (n=210), (n=3) and a second sweep for duplication errors.

RQ1. What are the key characteristics of the studies included in the review?

Study Characteristics

The study characteristics included the first author, year, country of origin, study aims, sample size, population, study settings, data collection methods, type of analysis, study design, type and details of online academic student support provided, and the reported outcomes (Appendix 1).

Year Published and Country of Origin

The number of published studies increased after 2017, with five studies published in 2021, three in 2020, followed by two studies in 2019 and one study each in 2017 and 2016. Four studies originated from the US, two from China, and one each from South Africa, Hungary, UK, West Indies, Indonesia, and Thailand.

Study Aims

Five studies investigated the extent to which online academic student support provided achieved measurable outcomes, including student performance, grades, or achievements (Table 1). Improved content knowledge or learning was the focus of two of these five studies. Five studies collected student views on their experiences and their satisfaction with the institutional support provided. Three studies investigated the effects of student support on student engagement (n=1), retention (n=1), or social integration (n=1). Other studies collected information on student perceptions of self-efficacy (n=1), and preferences between face-to-face and online support (n=1). Note: three papers had more than one aim; therefore, the total number of aims exceeds the number of papers.

Table 1

Study Aims and Authors

Aims	Number of studies and first author
Online academic student support provided achieved measurable outcomes (e.g., student performance, grades, achievements, or learning)	5 = Bognár; Luo; Oluwafolakemi; Park; Richardson
Satisfaction and perceptions of institution support	5 = Mulyono; Trespalacios; Ulla; van Wyk; Walters-Archie
Student engagement	1 = He
Retention	1 = Eaton
Social integration	1 = Eaton
Student perceptions of self-efficacy	1 = Trespalacios
Preferences between face-to-face and online support	1 = Richardson

Sample

The smallest sample size was 33 and the largest comprised over 60,000 students. Three studies fell in the category of 0-99 participants, five studies between 100-499, two studies between 1,000-5,000, and two studies > 10,000 students.

Study Setting and Population

All studies were concerned with online support provided to either undergraduate students, postgraduate students, or a combination of both enrolled in university courses. No studies were concerned with students enrolled in vocational courses. Of these population groups, students were taking courses in Humanities (n=1), English language (n=2), Education/Adult Education (n=3), Statistics or Research Methods (n=3), and 20th Century Literature (n=1), and academic/scientific reading and writing (n=2).

Data Collection

Five of the studies collected data from multiple sources and seven from a singular source. The type of data sources included independent web-based online platforms (n=2), LMS data (n=5), surveys (n=5), questionnaires (n=4), and interviews (n=2).

Study Design and Type of Analysis

Seven studies were quantitative and the rest (n=5) were mixed-methods studies. Descriptive statistics were the most frequently used type of analysis (n=9) for quantitative data, followed by statistical tests (n=5); some studies used both methods. The most used analysis for qualitative data included thematic analysis (n=5), and content analysis (n=1). Control groups were reported in three studies.

Type and Details of Online Support

Student support was either provided asynchronously (n=9) or both synchronously and asynchronously (n=3). While all studies provided varying forms of academic support, two of them provided pre-course support during student orientation. Online academic student support investigated across all studies made use of learning management systems such as Moodle or Blackboard to provide a variety of support tools. Quizzes to enhance student reflection and success were discussed in one study and made available through the institution's LMS. Communication tools included discussion forums (n=4), social media (n=5), messaging (n=3), email (n=3), videos (n=2), conferencing tool (n=2), chatbot (n=1), phone calls (n=1), shared database (n=1), open education resources (n=1), blogs (n=1), announcements (n=1), academic advising (n=1), and dynamic summative material (n=1).

RQ2. What student outcomes are reported across the studies included in this review, and how do they vary across different types of student support?

Outcomes

Outcomes were reported across the studies and varied significantly across the types in the areas of engagement (n=6), student support access or usage patterns (n=5), satisfaction (n=4), academic performance (n=2), motivation (n=1), creativity (n=1), self-efficacy, including the

ability to navigate online technology (n=3), retention or course completion (n=2), and social benefits (n=3). These reported outcomes are detailed below.

Engagement and Motivation

He et al. (2019) found a significant positive correlation between the use of online learning support (OLS), service types (LMS messages, chatbot for after-hours, and dynamically updated weekly summaries), and student engagement. However, when the number of OLS services used exceeded a certain range, there was no correlation in terms of video utilisation. Oluwafolakemi et al. (2021) reported that students in Harbin found their peer-to-peer learning activities—facilitated by social media—did support their online learning. Compared with Blackboard discussion forums, Luo et al. (2019) confirmed that Twitter was an effective support to engage students. Trespalacios et al. (2021) reported high levels of student self-efficacy in interacting academically with classmates and instructors. WhatsApp and Facebook groups were perceived as useful forms of learning support types (Mulyono et al., 2021; Ulla & Perales, 2021) as they increased feelings of connectedness with peers, were seen as source of motivation, and fostered creativity and independent learning.

Access and Usage Patterns

Bognár et al. (2021) and He et al. (2019) found that students tended to access online academic student support (quizzes and other online learning services) more frequently closer to module exams with a sharp drop in usage after (He et al., 2019). Oluwafolakemi et al. (2021) noted that approximately 60% of the participants used social media for peer-to-peer learning interactions daily within their peer-assisted learning cluster before the transition. Peers at The Federal University of Technology, Akure (FUTA) in Nigeria used a variety of types of student support in their peer-to-peer learning interaction, while those in universities in Harpin (China) mainly used social media. There was a stark increase in the frequency of learning interaction among students in universities in Harpin but students in FUTA could not make this quick transition due to institutional and infrastructural challenges (Oluwafolakemi et al., 2021). According to Luo et al. (2019), students who used Twitter for peer-to-peer learning participated more actively through this support type than in the Blackboard discussion forums. Most students published their tweets in response to question prompts while searching and reading their peers' tweets (Luo et al., 2019). Comparing online with face-to-face support, Richardson (2016) found that students with and without disabilities were equally likely to choose online support rather than face-to-face support.

Student Satisfaction

Luo et al. (2019) reported students that used Twitter rated the application highly across all domains of their perceived learning experience. Similarly, students that accessed WhatsApp and Facebook types of student support reported high levels of satisfaction (Mulyono et al., 2021; Ulla & Perales, 2021). van Wyk (2020) found that student teachers were satisfied and experienced the academic support tools accessed through the LMS as positively applied to their online learning. The discussion forum was rated as the most appropriate academic support e-tool in the course during the COVID-19 lockdown. Walters-Archie (2017) reported that 80% of students were aware of the support services being provided. The first three phases of the online orientation were seen to be the most beneficial (94%). Tips posted by course delivery assistants (CDAs) were considered useful types of support by 56% of the students, and excellent by 36% of

the students. Over half of the students found types of email support (60%) and Skype support (65%) to be good and a smaller percentage (22% and 9% respectively), excellent (Walters-Archie, 2017). Student feedback collected by Trespalacios et al. (2021) illustrated that most students (83%) rated program-specific academic advising as an important type of support with most of them (76%) being satisfied with the information provided. Other feedback pertained to an increased feeling of safety during the COVID-19 pandemic as the Facebook group prevented students from the possibility of catching the virus, and its convenience of accessing the learning support (Ulla & Perales, 2021).

Academic Performance

Compared to students who accessed types of online support, excluding quizzes, Bognár et al. (2021) reported that the more frequently and more often students self-quizzed when approaching graded tests, the higher the grades they achieved. Students who received excellent grades self-quizzed 2-3 times more than those who received satisfactory grades and these students self-quizzed 2-3 times more than those who failed. Time and energy invested in self-quizzing are reflected in the results achieved at the end of the learning period with the best results using self-quizzing and self-reflection, regardless of baseline abilities (Bognár et al., 2021). In a performance analysis course, Park and Robinson (2021) reported "the average score of students was higher when students received more feedback and comments from an academic coach than less feedback and comments in the performance analysis course. Students who had an academic coach in the adult education class performed better than those who did not have a coach" (p. 70). Richardson (2016) reported no differences in grades and course completion in students, with and without disabilities, who selected face-to-face or online support types. "There was a non-significant tendency for students with disabilities to achieve a lower pass rate than students without disabilities with face-to-face support, whereas with online support their pass rate was marginally higher than that of students without disabilities" (Richardson, 2016, p. 83). Luo et al. (2019) reported "students perceived Twitter to be helpful in articulating their understanding of the course material and in enhancing critical thinking. They also reported that they had fun using Twitter as a discussion tool for reflective learning." (p. 40).

Retention and Course Completion

Bognár et al. (2021) reported that most full-time students who completed the quizzes 100 to 150 times achieved the 70 points required to complete the course while there was many correspondence students (even though they had 500 attempts and more) who did not achieve course completion. According to Eaton and Cates (2020), student engagement with the university-sponsored types of social media including Facebook, Yammer, and Blackboard was significantly associated with higher scores in student retention.

Social Benefits

In terms of social benefits, three studies reported types of support that increased students' sense of community: belonging (Eaton & Cates, 2020), social interaction with classmates, and connectedness with peers (Mulyono et al., 2021; Trespalacios et al., 2021).

Navigation of Online Technology

An increased ability to navigate technology was described by two studies. Compared to the Blackboard discussion forums, students found academic support from Twitter (now X) easier

and faster to follow conversations and find others' opinions to review and discuss (Luo et al., 2019). Trespalacios et al. (2021) reported on students' increased ability to complete an online course and specifically handle LMS tools.

RQ3. What is the methodological design quality of the included studies as assessed by the CASP and EPHPP quality appraisal tools?

Study Quality Appraisal

All 12 included studies were assessed with the EPHPP tool and the qualitative components of five were assessed with the CASP tool to determine the methodological design quality of the 12 included studies.

Quantitative Studies

Seven of the 12 included studies were fully quantitative and therefore assessed only with the EPHPP tool. The final rating of all quantitative studies was weak. However, in the individual domain of selection bias, three of these papers showed moderate adherence to this section, which meant that participants were seen to be somewhat likely to represent the target population and between 60% and 79% of the selected individuals agreed to participate in the study (He et al., 2019; Oluwafolakemi et al., 2021; van Wyk, 2020). Data collection methods were another area where five of the weak papers achieved strong results, as the authors described these methods to be valid and/or reliable (Eaton & Cates, 2020; Luo et al., 2019; Mulyono et al., 2021; Trespalacios et al., 2021; van Wyk, 2020).

Mixed-Methods Studies

The remaining five papers were mixed-methods studies. While assessments of quantitative data with the EPHPP tool resulted in final weak ratings, results of the CASP assessment of the qualitative components of these studies resulted in four strong ratings (Luo et al., 2019; Trespalacios et al., 2021; Ulla & Perales, 2021; van Wyk, 2020), and one moderate rating (Walters-Archie, 2017). Walters-Archie (2018) did not achieve a strong CASP rating because too little information was provided on the recruitment strategy and the value of the research.

Discussion

The purpose of this review was to systematically examine the literature on effective practices of facilitating online academic student support in online higher education with particular attention paid to the studies' characteristics, reported outcomes, and methodological quality. In the following section, we discuss and summarize evidence and limitations followed by a conclusion that provides an interpretation of the results. Three broad research questions were specified in relation to our study objectives.

Summary of Evidence

RQ1 investigated the key characteristics of studies included in the review. Study characteristics were described and presented in tabular form and included the first author, year, country of origin, study aims, sample size, population, study setting, data collection methods, type of analysis, study design, type and details of online academic student support provided, and

reported outcomes (Appendix 1). Despite an exhaustive search, our literature review did not uncover studies of the use of online academic student support in vocational education settings.

RQ2 explored student outcomes as reported across the studies included in this review, and how they vary across different types of student support. Student outcomes across these studies and support types included improved academic outcomes (Bognár et al., 2021; Luo et al., 2019; Park & Robinson, 2021; Richardson, 2016), student satisfaction with the institutional resources and general support (Luo et al., 2019; Trespalacios et al., 2021; van Wyk, 2020; Walters-Archie, 2017), greater student engagement and retention (Bognár et al., 2021; Eaton & Cates, 2020; He et al., 2019; Luo et al., 2019; Oluwafolakemi et al., 2021; Trespalacios et al., 2021), social benefits (Eaton & Cates, 2020; Mulyono et al., 2021; Trespalacios et al., 2021; Ulla & Perales, 2021), increased student motivation and self-efficacy (Luo et al., 2019; Mulyono et al., 2021; Trespalacios et al., 2021; Ulla & Perales, 2021), improved creativity and independent learning (Ulla & Perales, 2021) and a determination of students' support preferences (Bognár et al., 2021; He et al., 2019; Luo et al., 2019; Oluwafolakemi et al., 2021; Richardson, 2016). WhatsApp and Facebook groups were perceived as useful types of learning support because they fostered a sense of connectedness, enhanced students' creativity, and provided a space for free exploration and motivation to learn independently (Mulyono et al., 2021; Ulla & Perales, 2021). Other feedback pertained to an increased feeling of safety during the COVID-19 pandemic, as the Facebook group prevented students from the possibility of catching the virus, and its convenience of accessing the online learning support (Ulla & Perales, 2021).

Unsurprisingly, with such diverse outcomes across these studies, the types of student support differed in their approach to addressing online students' needs. The results illustrate that one type of student support cannot cater to the multifaceted needs of higher education students and their institutions. Online academic student support is multidimensional and higher education and vocational education providers must define desired outcomes of student support before implementing online academic student support practices.

What is clear from the systematic review is that online academic student support makes a tangible difference regardless of the type of support when it comes to improved academic outcomes and student satisfaction. Given that improved academic outcomes, student satisfaction, and increased engagement often lead to lower attrition rates for a delivery mode that is historically plagued by high attrition rates, it is timely for higher education providers to rethink the provision of online academic student support, given the increasing enrolments into fully online programs globally (Albert et al., 2021; Morris et al., 2020). Considering so many higher education students are already using social media and multiplatform messaging apps, our findings suggest these types of academic student support may be an advantageous starting point for higher education providers when considering implementing online academic student support (McLaughlin & Sillence, 2023).

RQ3 investigated the methodological design quality of the included studies as assessed by the CASP and EPHPP quality appraisal tools. Methodologically, all seven quantitative studies rated weak, as were the quantitative part of the remaining five mixed-methods studies. However, the qualitative part of four mixed-method studies was rated strong and one moderate (Table 2). This suggests that the five mixed-method studies better conceptualized, designed, and executed their qualitative research aspects. The four strong and one moderate ratings are indicative of

well-defined research questions, suitable sampling methods, rigorous data collection procedures, and in-depth analysis of the qualitative elements. Nonetheless, the utilization of the EPHPP tool, specifically tailored for quantitative research, revealed a consistent "weak" rating across all twelve studies assessed. This uniform result raises significant concerns about the methodological rigor of these studies. Such a consistent trend suggests potential systemic issues in the way educational research is conducted within the domain of online student support. The findings emphasize an urgent need for heightened scrutiny and a call for enhanced methodological designs in future quantitative inquiries in the field of online academic student support.

Table 2

Study Quality Appraisal

Publication	**Research type**	**Total score EPHPP**	**Total score CASP**
Bognár	Quantitative	weak	N/A
Eaton	Quantitative	weak	N/A
He	Quantitative	weak	N/A
Mulyono	Quantitative	weak	N/A
Oluwafolakemi	Quantitative	weak	N/A
Park	Quantitative	weak	N/A
Richardson	Quantitative	weak	N/A
Luo	Mixed methods	weak	strong
Trespalacios	Mixed methods	weak	strong
Ulla	Mixed methods	weak	strong
Van Wyck	Mixed methods	weak	strong
Walters- Archie	Mixed methods	weak	moderate

Commonalities in student support practices (Table 3) were noted in that all studies reported support embedded within the LMS, though five were linked to external social media platforms (Eaton & Cates, 2020; Luo et al., 2019; Mulyono et al., 2021; Oluwafolakemi et al., 2021; Ulla & Perales, 2021). All support practices were delivered asynchronously with only three of the 12 studies making use of both synchronous and asynchronous support practices (Trespalacios et al., 2021; van Wyk, 2020; Walters-Archie, 2017). Asynchronous student support practices reflect the rise, and possibly the acceptance, of online delivery of courses. The rapid shift to online delivery because of the COVID-19 pandemic is an expected trend that will stay in higher education for the foreseeable future, thus requiring a reimagining of online delivery (Croucher & Locke, 2020). Going forward, asynchronous support will be essential to cater for online teaching and learning to meet the students' support demands at their point of need. Studies have shown that regular structured support for learners increases program satisfaction (Gregori et al., 2018; Pélissier, 2019).

Table 3

Online Student Support Practices

	Online student support provided			
	via LMS	External social media platforms	Asynchronously	Synchronously and asynchronously
Bognár	x		x	
Eaton	x	x	x	
He	x		x	
Luo	x	x	x	
Mulyono	x	x	x	
Oluwafolakemi	x	x	x	
Park	x		x	
Richardson	x		x	
Trespalacios	x		x	x
Ulla		x	x	
Van Wyck	x		x	x
Walters- Archie	x		x	x

Limitations

The systematic literature review's validity may be compromised at both the study and outcome levels. This review's selection criteria included a quality appraisal of the methodology at the study level. The quality appraisal revealed that the research on facilitating student support in higher education courses examined in this study were not methodologically strong. There was a complete absence of papers focusing on online academic support in vocational education that matched our inclusion criteria. Consequently, 12 studies were selected for this review. The selection criteria were comprehensive and the validity of the review's reported conclusions regarding the outcomes reflect the design of methodologically rigorous studies. A limitation in the outcomes is that eight of the 12 reported outcomes (Bognár et al., 2021; Eaton & Cates, 2020; Mulyono et al., 2021; Oluwafolakemi et al., 2021; Park & Robinson, 2021; Trespalacios et al., 2021; Ulla & Perales, 2021; van Wyk, 2020) were published from studies after 2020 when a rapid shift enforced an unplanned change to online education as a result of the COVID-19 pandemic.

Identified Research Gaps

While this review yielded significant findings, it did have several drawbacks. Previous studies that were systematically reviewed explained student outcomes without a thorough quality appraisal with validated appraisal tools to ensure that conclusions were drawn from high-quality scientific research. Future research on online academic student support that is methodologically strong can provide greater insight to educational providers who are considering implementing academic support to improve aspects of the online higher educational provision. Online teaching and academic student support in vocational education are insufficiently researched, yet there has been a steady increase in online vocational education offerings by polytechnic institutes, dual-

sector universities, and registered training organisations. Like online higher education students, online vocational education students experience high attrition rates when compared to on-campus students (Billett et al., 2020; Boton & Gregory, 2015; Grau-Valldosera et al., 2018; Greenland & Moore, 2014; Hall & Harvey, 2021; Moore & Greenland, 2017; Nieuwoudt, 2020).

Conclusion

This systematic review of the literature is the first to evaluate the effective practices of facilitating online academic student support in higher education, including vocational education. We identified a sizable body of research that had not been formally evaluated systematically to understand and draw conclusions on best practices in online academic student support with a particular focus on student outcomes. Outcomes reported are significant for the higher education sector because they lead to students' improved access to support, engagement, satisfaction, academic performance, motivation, creativity, self-efficacy including one's ability to navigate technology, retention or course completion, and social benefits. As online education continues to take on an increasingly larger role in the delivery of higher education, it is important to understand what practices of online academic student support are effective in each context, as well as how online academic student support is offered and its take-up amongst students. Even though conclusions cannot be drawn, the findings suggest that online academic student support has the potential to successfully overcome high attrition rates (Ali & Smith, 2015; Wang et al., 2019) and low satisfaction rates of online programs (Fish & Snodgrass, 2015; Gray & DiLoreto, 2016) that can negatively impact student satisfaction and a higher education provider's revenue generation.

Future Research Recommendations

This review provides a stimulus for exploring new ways to incorporate online academic student support into the provision of higher education. Conversely, this review has revealed there is more to learn about how providing online academic student support can potentially improve or reverse students' feelings about lack of belonging or connection (Canty et al., 2020; Jackson et al., 2010), social isolation (George et al., 2021; Joyner et al., 2020; Kaufmann & Vallade, 2020) and disconnectedness from other students, staff and the institution (Canty et al., 2020; Kember et al., 2021). Future exploration of online academic student support is critical in enhancing the successful provision of higher education in a post-COVID-19 landscape. This systematic review is beneficial for supporting education providers in a rapidly changing educational landscape where more students, from even more diverse backgrounds, will enroll in online degrees. Many of these students will not experience higher education and vocational education on campus, and to ameliorate high attrition rates and low satisfaction, research into online academic student support is warranted.

The exploration of online academic student support that leads to positive student outcomes is ripe for future consideration. This systematic review of the literature has focused on the practices of online academic student support outcomes, however, with the rapid growth of online learning, exploration of the transferability of online academic student support could be examined for its suitability and engagement with high school students who are increasingly able to attend higher education. The lack of studies that focus exclusively on vocational education to

establish what the sector is doing in terms of providing online academic student support is concerning, as providers are not equipped to understand and enact practices that have the potential to increase student satisfaction and turn around high attrition rates.

Declarations

Availability of data and material

The datasets generated and/or analysed during the current study are available in the SysRev https://sysrev.com/

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