

Review

# Higher Education Students' Online Instruction Perceptions: A Quality Virtual Learning Environment

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**Abstract:** Online instruction has been one of the key delivery methods in the midst of the COVID-19 pandemic due to school closures around the globe. In accordance with the Malaysia Education Blueprint (2013–2025), maximizing the use of information/communication technology has been emphasized to scale up learning quality across Malaysia, including distance and self-paced learning. However, online learning in the country is at its infancy stage with raised issues, causing dropping-out and school leaving in higher education. To improve teaching and learning quality, this scoping review aimed to explore higher education students' online instruction perceptions into two main components: research on online instruction perceptions followed by factors influencing online instruction perceptions. Using Arksey and O'Malley (2005)'s methodological framework, 61 articles related to students' online instruction perceptions were identified from Google Scholar, ERIC, and Research Gate databases. In terms of theoretical articles, the results showed that cognitivism, connectivism, and constructivism were the most used theories of online instruction. On the basis of the empirical articles gathered, quantitative research design was the most utilized to collect students' perspectives toward online instruction. As a whole, the findings revealed that motivation and satisfaction were mostly positively perceived by students, whereas, a lack of interaction was highly categorized as an unfavorable online instruction perception. Three main factors were identified: quality instruction, online interaction, and instructional and technical support. Future studies can focus on investigating teachers' online instruction perceptions to achieve quality in higher education.

**Keywords:** online instruction; higher education; students' perceptions; education quality; online learning



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## 1. Introduction

A controversy over online instruction perceptions has left people in unquestionable doubt. Due to the global pandemic, school closures have been considered an initiative measure in preventing the spread of viruses. Many educational institutions around the world have temporarily closed to cease the spread of the COVID-19 pandemic [1]. Many significant changes have been called upon for adoption, particularly education. With this sudden shift, online learning has been increasingly rising to continue the teaching and learning process. However, the pandemic has caused negative impacts on online education, such as learning loss [2] and exacerbated learning outcomes [3]. Online barriers can be hindrances, including cost [4], teachers' information and communication technology (ICT) skills and their demographic factors [5], poor infrastructure of the university [6,7], lack of online resources [8], classroom management in terms of student participation [9], and teachers' behavioral intentions in adopting online educational technology [10]. To ensure the effectiveness and quality of higher education in online learning, synthesizing existing literature on the significance of online instruction perceptions is critical.

Based on The United Nations' (UN) 17 Sustainable Development Goals (SDGs), one of the goals is to achieve quality education. Quality education not only aims to empower educational opportunities but also to alleviate poverty all around the world by 2030 [11].

According to The Star (2021), urgent action should be called upon in minimizing the digital divide in Peninsular Malaysia [12]. A number of issues pertaining to online accessibility and basic requirements are found to be addressed promptly, such as Internet connectivity, lack of resources and devices, in order to provide equity and quality in the education field. In line with the Malaysian higher education institution students' learning experiences, immediate action should be taken by universities to avoid losing their students, by considering their dissatisfactions; for instance, virtual learning mode implementation, availability of instructors, and learning performances [13]. Ensuring healthy well-being is imperative to sustainable development. During the pandemic, a study shows that most participants feel apprehensive and helpless [14]. Similarly, another study reveals that excess electronic access can impact tremendously on students' mental health and education in a long term [15]. Hence, quality instruction is essential to reduce stress level. By providing quality education, considering students' perspectives is imperative for integrating proper online instruction.

The quality of online instruction has been given some considerable attention since the rise of online courses offered in education. [16]. Quality online instruction should adhere to the seven principles of instructional practice for an effective teaching and learning process [17–19]. According to Chickering and Gamzon (1989), these seven principles pertain to good instructional practice in undergraduate education: (1) encourage student–faculty contact, (2) encourage cooperation among students, (3) encourage active learning, (4) give prompt feedback, (5) emphasize time on task, (6) communicate high expectations, and (7) respect diverse talents and ways of learning [20]. For student–faculty contact, it is crucial to establish a good rapport, as it is considered a source of student's motivation in determining their engagement and involvement. It can foster students to think about their values and future plans. In developing reciprocity and cooperation, frequent working collaboratively can increase involvement in learning. Sharing ideas and responding to reactions can stimulate thinking skills. Moreover, students are active learners who relate their learning experience and apply it in daily lives through active learning, such as discussions and projects. By providing adequate feedback on performance, it can enable students to assess and improve themselves. They require constructive and immediate suggestions to reflect on what they have learned. Next, effective time management is critical to high performance. Students are required to learn how to manage their time well for effective learning. High expectations stimulate students to perform more and motivate them to be well-prepared. Last but not least, each and every student has their own learning style, therefore, chances should be given to students to show their talents and learn in their way. Hence, this scoping review was guided by two research questions:

RQ1: What are students' online instruction perceptions?

RQ2: What are the factors influencing students' online instruction perceptions?

## 2. Literature Review

### 2.1. Defining Online Instruction

In general, online instruction is defined as an online learning delivery method between instructors and learners through facilitation and guidance with the use of technology. As shown in Table 1, online instruction can be implemented through asynchronous or synchronous online instruction.

**Table 1.** Types of online instruction.

Type of Online Instruction	Description	Author
Synchronous interactive online instruction (SIOI)	Use of audio and video as learning materials	[21–23]
Computer-assisted instruction	Use of computer technology to deliver training or educational materials	[24]
Video-based online instruction	A digital video technology instruction	[25,26]

Table 1. Cont.

Type of Online Instruction	Description	Author
Asynchronous online instruction	Does not require real-time interaction and access to online learning when it best suits time	[27–29]
Polite instruction	Politeness strategy	[30]
Learner-centered online instruction	Student-centered online instruction	[31]
Synchronous online instruction	Use of video conferencing and live chat or instant messaging	[32]
Goal instruction	A goal is specific, clear, and measurable.	[33]
Live instruction	A videoconferencing of carrying out essential tasks while together	[34]
Web-based instruction	A hypermedia-based instruction using World Wide Web resources	[35,36]
Auto-email instruction	Auto-generated email instruction	[37]
Case-based instruction	Case study-related instruction for asynchronous discussion	[38]
In-game instruction	Use of video games as online instruction	[39]
Synchronous and asynchronous	Live and non-live online instructions	[40]

## 2.2. Significance of Online Instruction

Students' online instruction perceptions play a critical role in determining learning attitudes, learning outcomes, and personal development. Over the years, many researchers have been endorsing the critical role of online instruction, including quality interaction [41], deep learning experience [42], positive social change [43], creative thinking [44], learning outcomes [45], and discovery learning [46]. Prominently, online instruction is found to impact learners' satisfaction and motivation through good online engagement [38,41,47–49] and constructive feedback [50–53]. In addition, numerous studies have revealed that online instruction is as effective as face-to-face instruction [22,54,55], including learning outcomes. Quality online instruction can promote a good virtual learning environment, resulting in the improvement of learning outcomes. With regard to personal development, students' learning needs and desires can be fulfilled through online instruction. In accordance with self-determination theory (SDT), research findings have reported that online instruction fulfills students' intrinsic needs, thus resulting in high satisfaction levels [56]. Other than that, positive impacts of online instruction on cultural awareness in terms of cultural knowledge and attitudes can be beneficial to some multicultural countries [57]. Instructors' roles have been strongly emphasized to facilitate online instruction, such as connectedness [58] and establishing a good rapport [59]. All in all, quality instruction is significant in creating a conducive virtual learning environment, particularly in higher education.

## 3. Materials and Methods

This research utilized a scoping review methodology [60] to examine online instruction and students' perceptions. Regarding the methodology framework, five stages were discussed: (1) identifying research questions, (2) identifying relevant studies, (3) selecting studies, (4) charting data, and (5) summarizing and reporting results.

### 3.1. Identifying Research Questions

This study was led by two research questions: What is the scope of research conducted on students' online instruction perceptions? What are the factors influencing students' online instruction perceptions? Articles that concentrate on students' online instruction perceptions or e-learning instruction perceptions were included to be the focus of the study. The target group was tertiary students. The breath of the study was further reviewed.

### 3.2. Identifying Relevant Studies

With regard to searching terms, three sets of keywords were used: (1) online instruction or e-learning instruction and (2) perceptions or attitudes. These combination sets of search terms were explored using Boolean operators. That is, the AND operator and OR operator were employed within the sets to discover relevant results. Articles were selected from indexed journals via three electronic databases, namely, Google Scholar, ERIC, and Research Gate, as these databases present a large collection of international education journals.

### 3.3. Study Selection: Inclusion and Exclusion Criteria

To determine appropriate criteria, inclusion and exclusion criteria were critical to set the boundaries for the scoping review. During the process of reviewing, areas of inclusion and exclusion criteria were critical to suit the requirements of the scoping review, such as type of publication, year, and language [61]. As delineated in Table 2, it shows inclusion and exclusion criteria of this scoping review.

**Table 2.** Inclusion and exclusion criteria.

Criterion	Inclusion	Exclusion
Type of Publication	Journal articles (peer-reviewed)	Book reviews, position papers, editorials, and commentaries
Year	2000–2021	<2000
Language	English	Non-English
Participant	Higher education students who enrolled in online learning classroom	All other students who did not enroll in online learning classroom
Setting	Education	Non-education
Exposure of Interest	Online instruction	Online communication, discussion, and interaction

Seven inclusion criteria were developed to meet the requirements for reviewing purposes:

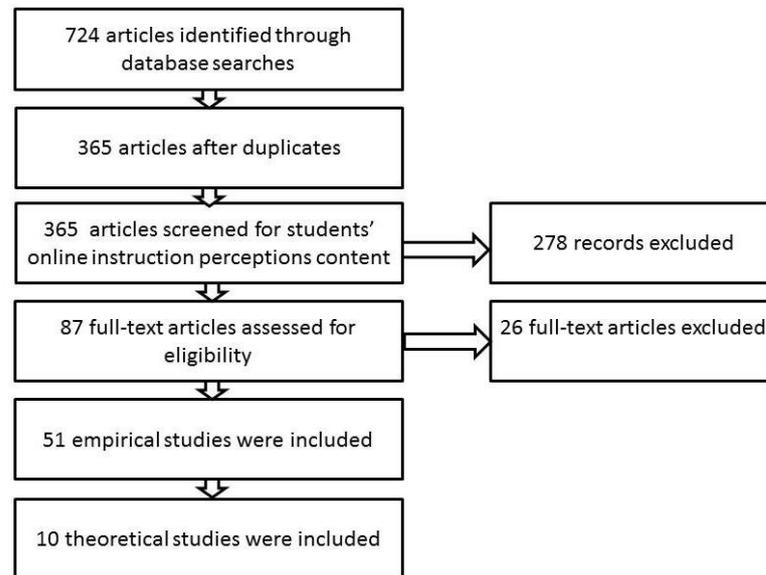
1. It should be dated in the period between 2000 and 2021 inclusively;
2. It should be conducted in the education field context in terms of the learning process;
3. It should report empirical evidence on results and implications;
4. It could focus on tertiary education;
5. It could employ a qualitative, quantitative or mixed method research design;
6. It could be asynchronous or synchronous online instruction perceptions;
7. It could be an online instructional design or an online learning tool for instruction purposes.

During the filtering process, nine exclusion criteria were measured to exclude articles that did not meet the following yardstick.

1. The article was not translated or written in English;
2. It focused solely on online education without emphasizing on instruction;
3. It focused on primary or secondary education;
4. It focused merely on instruction without relating it to school-based situations, especially online learning;
5. It focused on parental, teacher or faculty perspectives of online education instructions without examining online education instruction perceptions among the students;
6. It focused on online communication, online interaction or online discussion;
7. It focused solely on blended learning instruction or face-to-face instruction;
8. It focused on online instruction strategies;
9. If focused on online instruction perceptions in non-educational settings, such as medical and business contexts;
10. The article was excluded if it was published in other types of publications, including book reviews, position papers, editorials, and commentaries.

### 3.4. Charting Data

During the selection process, the chosen articles were classified on the basis of the key issues and themes of the review. As presented in Figure 1, it displays a flow diagram for the paper selection process.



**Figure 1.** Flow diagram for the paper selection process.

After screening 724 articles, 61 articles met the criteria. Specifically, articles were then sorted into two former sections known as theoretical and empirical papers. This scoping review further discussed students' online instruction perceptions in terms of positive and negative aspects, followed by factors influencing online instruction perceptions with implications.

## 4. Results

The report presents two types of studies, namely, theoretical ( $n = 10$ ) and empirical studies ( $n = 51$ ). It also examines the favorable and unfavorable online instruction perceptions throughout the study, followed by factors influencing online instruction perceptions.

### 4.1. Theoretical Studies

As displayed in Table 3, the theories related to online instruction are as follows:

**Table 3.** Learning theories and models related to online instruction.

Category	Description	Author
Learning Theories	Cognitivism	[62]
	Connectivism	
	Heutagogy	
	Social Learning Theory	
	Transformative Learning Theory	
	Vygotsky's Zone of Proximal Development	

Table 3. Cont.

Category	Description	Author
Learning Models/Instructional Designs	Activity Theory	[63]
	Literary Theory	[35]
	Cognitivism	[64]
	Behaviorism	
	Constructivism	
	Humanism	[29,31]
	Constructivism	
	Brain-based Learning Andragogy	[65]
	Gestalt Theory	[66]
	Case-based Method Instructional Design	[67]
Community-based Learning	[50]	

Based on Table 3, ten retrieved articles discussed learning theories and models as fundamental frameworks for online instruction. Cognitivism and constructivism shed some light on the importance of internal processes, such as cognitive development and prior knowledge in online learning. In cognitivism, three types of cognitive loads were identified: intrinsic, extraneous, and germane loads. Online instructional design should reduce cognitive load for online learners to keep instruction clear and concise. On this matter, strong stimuli should be employed in the discovery phase for online learners to make a connection to their prior knowledge [62]. Constructivism implies that collaborative learning is imperative to engage real-life experience learning and enhance metacognitive skills [29,31]. In opposition to cognitivism, behaviorists revolve around overt behavior to be observed and measured through learning outcomes. Notably, the implication of behaviorism is to provide feedback by monitoring students' achievement levels and take corrective action if possible.

Connectivism, heutagogy, and transformative learning theories highlight the benefits of autonomy. Autonomy allows students to be independent and autonomous to explore knowledge. Regarding connectivism, students should optimize the use of technology to substantially expose themselves to information technology and always keep up-to-date for authentic learning [68]. As learners are active participants, heutagogy theory outlines that instructors' roles should be passive as monitors and course designers to promote self-paced learning among learners [62]. Transformative learning theory suggests fostering interactive learning in online learning.

Regarding activity theory, Walker (2020) illustrated underlining online communication and online discussion to facilitate understanding [63]. Gestalt theory expresses prominence of the laws of perception in shaping one's perception in an environment. According to Leftlore (2000), web-based instructional pages should be based on visual design as online learning extremely depends on visual perception [66]. Adequate guidance should be provided to encourage students engaging in online activities. Gray (2019) proposed that literary theory connects online courses as texts to form meaningful interaction and enhance online interaction [35]. Meanwhile, learners can interact with course content at the meaning-making level, increasing one's production and participation.

Case-based methods in instructional design are imperative for self-directed online instruction [67]. Clemons (2005) identified four rudimentary implications of brain-based learning theory, namely memory and retrieval, learning styles, role of emotion, and increasing attentiveness [65]. For instance, students should be given some time to process information after every 10 min of information sharing. A community-based learning

project focuses on quality online design, learner-centered and project-based learning in the alignment to online instruction [50].

As a whole, motivation has been remarkably highlighted in most theories related to online instruction, including intrinsic and extrinsic motivations. Motivation is the core of the learning process to determine one's aspiration and achievement.

#### 4.2. Empirical Studies

A total of 51 empirical articles were reviewed in examining students' online instruction perceptions. In Table 4, they are outlined as follows:

**Table 4.** Students' online instruction perceptions.

Author	Year	Location	Type of Online Instruction	Study Design/Participant Sample	Outcome
(1) [22]	2010	USA	SIOI	Quantitative (Survey) <i>n</i> = 124 (77% participation rate)	Overall, SIOI can be as effective as face-to-face instruction.
(2) [33]	2008	USA	Goal instruction	Quantitative (Survey) <i>n</i> = 131	High issue knowledge students held positive perceptions toward goal instruction regarding controlled prior knowledge.
(3) [37]	2001	USA	Instructor-initiated audio e-mails	Case study	The increment of students' participation in group discussion promoted their relationship with others and sense of belonging. It also demonstrated greater satisfaction with the learning experience.
(4) [38]	2009	USA	Case-based instruction through asynchronous discussions	Quantitative (survey)	Case-based instruction was significantly useful. Students' participation levels and learning perceptions were correlative.
(5) [47]	2003	USA	Seven principles of effective online instruction	Quantitative research Numbers of participants are not stated.	For instructors, adherence to the seven principles of effective instruction required experience to bring a pedagogical value.
(6) [48]	2018	USA	Online instruction	Quantitative (Survey) <i>n</i> = 667	Students perceived positive learning, progression and satisfaction due to high engagement level and moderate transactional level.
(7) [49]	2018	USA	Online instruction	Quantitative (Survey using Moore's Interaction Framework) <i>n</i> = 155	Learner-instructor engagement is most beneficial engagement strategy. Students valued regular post announcement, grading and assessment were useful for learner-learner engagement.
(8) [50]	2011	USA	Online instructional support	Quantitative (Survey) <i>n</i> = 110	Perceived support was correlative to students' satisfaction.
(9) [51]	2011	Russia	Asynchronous online instruction	Mix-methods (Pre and post survey and semi-structured interviews)	Cultural influences could be a potential hurdle to online instruction in terms of online learning environment and cultural background.

Table 4. Cont.

Author	Year	Location	Type of Online Instruction	Study Design/Participant Sample	Outcome
(10) [52]	2013	USA	Online strategy instruction for integrating dictionary skills and language instruction	Quantitative (questionnaire) <i>n</i> = 64	Most participants had positive perceptions toward instruction due to its effectiveness and usefulness. Regarding student performance, significant gains were shown in the online strategy instruction group compared with the comparison group.
(11) [53]	2013	USA	Online instruction	Quantitative (Survey)	Overall, in highly-rated courses, instructors were receptive to questions, responded promptly to emails, provided timely feedback, posted grades in a timely manner, and perceived as active participants in the online class.
(12) [54]	2004	USA	Online instruction vs. campus instruction	Numbers of participants are not stated.	Most students showed their favorable perceptions toward online instruction. Some students preferred both modes of instruction.
(13) [55]	2005	USA	Online instruction quality	Numbers of participants are not stated.	No significant difference was observed between quality online instruction and face-to-face instruction.
(14) [56]	2020	Indonesia	Asynchronous pre-class online video lectures (AOVL) for flipped-classroom instruction	Mixed methods <i>n</i> = 31 (quantitative questionnaire) and <i>n</i> = 10 (qualitative-group interview)	The use of AOVL in online instruction enhanced students' intrinsic motivation and autonomy, as stated in SDT.
(15) [69]	2005	USA	Asynchronous and synchronous online instruction	Exploratory study (Interviews)	Learning outcomes and retention showed no significant difference with traditional course. Students held positive perception towards online instruction in terms of flexibility and effectiveness.
(16) [70]	2017	Korea and USA	Online instruction	Quantitative research <i>n</i> = 180	Students with high self-regulation demonstrated higher affective outcomes and stronger sense of Community of Inquiry (CoI).
(17) [71]	2009	Canada	Computer assisted instruction	Mix-methods (Survey and interviews) <i>n</i> = 30	The result concluded that effective instructor feedback had a positive impact on learning outcomes. Five major themes were analyzed: positive constructive, gentle guidance, student involvement, orientation and timeliness.
(18) [72]	2008	USA	Online instruction	Quantitative (Survey) <i>n</i> = 90	Students reported their satisfaction toward online instruction. However, the result showed that flexibility factor outweighs the need for the interaction with the instructor and peer.

Table 4. Cont.

Author	Year	Location	Type of Online Instruction	Study Design/Participant Sample	Outcome
(19) [73]	2018	USA	Online instruction	Quantitative (Survey) <i>n</i> = 97	Three variables determined quality online instruction were instructor feedback, peer interaction, and student support.
(20) [74]	2020	Taiwan and USA	Online flipped writing instruction	Qualitative research (reflective journals and interviews) <i>n</i> = 48	Flipped instruction strengthened writing proficiency. It also promoted positive self-motivation, enhanced learning experience, and improved cross-cultural observation.
(21) [75]	2007	Norman	Online instruction	Quantitative (survey) <i>n</i> = 304 (40% participation rate)	Students showed greater satisfaction with the nature and format of work and in the assessment associated with grading.
(22) [76]	2015	USA	Online instruction vs. campus instruction	Quantitative (survey) <i>n</i> = 370 (online) <i>n</i> = 360 (face-to-face)	Two outcomes were identified: (1) perceptions might be based on old typologies of distance education and (2) teaching presence and self-regulated learning influenced course preferences.
(23) [77]	2021	USA	Online instruction	Quantitative (Latent profile analysis)	Improved learning outcomes and engagement were observed in high student-student and student-instructor interactive courses.
(24) [78]	2020	England	Web-based instruction	Numbers of participants are not stated.	Frequent interaction was essential to promote students' motivation.
(25) [79]	2018	USA	Online instructional design and hybrid courses	Mixed methods (quantitative research such as experiments and surveys and qualitative research such as interviews and open-ended survey questions). <i>n</i> = 62	For quantitative data, no statistical difference was detected within these groups regarding learner engagement and satisfaction. Nevertheless, the relationship between instructor feedback and learner engagement showed a significant difference. Relevant themes of qualitative data were mostly based on a student-centered approach with regard to factors contributing to learner engagement (e.g., instructor presence and learning style) and learner satisfaction (e.g., student-centered instruction and sense of community).
(26) [80]	2018	Indonesia	Web-based instruction	Mixed methods of using questionnaire and interview by utilizing the four-D model of instructional development (Define, Design, Develop, and Disseminate). <i>n</i> = 19	Web-based instruction was useful in terms of enhancing understanding, self-regulation, interaction, and self-motivation. Overall, using web-based modules was easy.

Table 4. Cont.

Author	Year	Location	Type of Online Instruction	Study Design/Participant Sample	Outcome
(27) [81]	2015	USA	Online instruction	Quantitative (survey instrument using the Quality Matters [QM] rubric) <i>n</i> = 3160	Online instruction was clear in terms of ease of navigation, which was highly rated. However, interactions with peers and instructors should be paid adequate attention.
(28) [82]	2002	Taiwan	Supplement in-class instruction using ESL/EFL websites	Quantitative (questionnaire inquiring about their computer usage habits (experience using the web, frequency of web usage) and their familiarity with websites that they could use to practice their English skills) <i>n</i> = 49	Students favored learning English using ESL/EFL websites. The teaching strategies were effective and useful.
(29) [83]	2014	USA	Online instruction	Online Student Connectedness Survey (OSCS) and the CoI survey have been previously used to study student connectedness and perception of online learning	Student connectedness was significant to social presence, teaching presence, and cognitive presence predictors. Students required more flexibility in the online learning environment.
(30) [84]	2005	USA	Online instruction	Numbers of participants are not stated.	Online instruction should include instructional support, prior knowledge with computers and interaction to promote students' motivation.
(31) [85]	2005	USA	Online instruction	Quantitative (questionnaire) <i>n</i> = 266 (random sampling)	Students reported that online instruction had no significant difference in terms of interaction in the comparison with face-to-face instruction.
(32) [86]	2009	USA	Asynchronous online instruction	Experimental research design (Twenty-four subjects applied to the 782 utterances of the participants.)	Significant improvement through instructional practices was observed. Online learning groups relied on instruction heavily for knowledge construction and meaning negotiation.
(33) [87]	2018	Indonesia	Online blogging writing instruction	Qualitative (Questionnaire and interviews) <i>n</i> = 30	Blogging into writing instruction was effective in developing fluency and awareness of writing for audiences.

Table 4. Cont.

Author	Year	Location	Type of Online Instruction	Study Design/Participant Sample	Outcome
(34) [88]	2019	England	Online instructional quality	Quantitative (Questionnaire of instructional quality design and questionnaire with the technology acceptance model constructs). <i>n</i> = 161	Quality instruction had a positive influence on students' acceptance toward the online learning environment.
(35) [89]	2014	USA	Online instruction	Quantitative (Survey) <i>n</i> = 553	Online instruction was rated as moderately satisfactory in contrast to hybrid online course instruction. Students reported that convenience was the highly rated reason for satisfaction. Meanwhile, lack of interaction was the main factor of dissatisfaction.
(36) [90]	2010	USA	Asynchronous and synchronous online instruction using CoI model	Quantitative (questionnaire) <i>n</i> = 10	Students experienced a developed community of inquiry. Cognitive, social and teaching presence elements were correlative.
(37) [91]	2007	USA	Online instruction	Quantitative (Survey) <i>n</i> = 113	Based on the quantitative data, 88% of students perceived online instruction as a positive learning experience. However, lack of communication between instructors and students was the main concern.
(38) [92]	2001	USA	Computer-based instruction	Numbers of participants are not stated.	Most of the student engagement time dwindled to computer-based instructions and it led to a fall in student success
(39) [93]	2002	USA	Online instruction vs. campus instruction	Quantitative (Questionnaire) <i>n</i> = 42	Some concerns expressed were the lack of instructor–student interaction, followed by hardware and software operations. Students' written comments revealed the significance of flexibility and stress release.
(40) [94]	2015	USA	Online instruction	Quantitative <i>n</i> = 249	The interaction with instructors and peers had a huge impact on students' satisfaction.
(41) [95]	2011	USA	Online instruction	Qualitative (Interviews, observation and online focus group)	The finding mentioned that online learning could be superficial without a clear instruction.
(42) [96]	2009	USA	Web-based instruction	Quantitative (Survey)	Student–student and instructor–student interactions were critical to student learning and satisfaction.
(43) [97]	2020	Malaysia	Asynchronous and synchronous online instruction	Quantitative (Survey) <i>n</i> = 30	Students' perspectives were influenced by lack of peer interaction and unclear assessment strategy, lack of instructional support and feedback.

Table 4. Cont.

Author	Year	Location	Type of Online Instruction	Study Design/Participant Sample	Outcome
(44) [98]	2018	USA	Quality online instruction	Quantitative (Questionnaire)	Students' intent to persist in school was found to have no significant relationship with teaching presence, instructors' competency, and verbal immediacy.
(45) [99]	2009	Turkey	Web-based instruction	Quantitative (Survey questionnaire)	Due to some constrains, such as technology incompetency and non-verbal communication, students revealed their preference for face-to-face instruction over online instruction.
(46) [100]	2005	USA	Online instruction	Quantitative (Group Embedded Figure Test and attitude survey toward online instruction) <i>n</i> = 104	No correlated relationship was observed between students' attitudes and their preferences for instructional delivery modes. Meanwhile, computer competency and online learning experience had great impacts on students' attitudes toward online instruction and their learning outcomes.
(47) [101]	2020	Malaysia	Comprehensive online instruction	Quantitative (Questionnaire) <i>n</i> = 680	Research university students perceived online instruction as positive compared with non-research university students due to facilities and resources. Most students required further assistance and support in constant feedback, performance, and engagement.
(48) [102]	2021	USA	Online instruction	Mixed methods	Students expressed their concerns of exacerbating in the transition from face-to-face instruction to online instruction. A statistically significant difference was detected in cognitive and social presence. Instructors' support was imperative to their academic learning.
(49) [103]	2019	USA	Online instruction	Quantitative (Survey) <i>n</i> = 312	Overall, students favored online instruction. However, there could be a potential for academic dishonesty particularly cheating.
(50) [104]	2012	USA	Computer-aided instruction	Numbers of participants are not stated.	Most participants thought that lack of interaction could lead to students' dissatisfaction.
(51) [105]	2021	China	Asynchronous and synchronous online instruction	Quantitative (Questionnaire and learning record) <i>n</i> = 60	Students experienced positive learning towards formative assessment and engaged actively in online activities.

#### 4.2.1. Favorable Online Instruction Perceptions Motivation and Satisfaction

Twelve articles endorsed the significance of satisfaction and motivation as a positive outlook of online instruction. The interactions of students with instructors, fellow students, and contents were considered as sources of high satisfaction and motivation levels. Three types of engagement strategies were recognized: (1) learner-to-learner interaction, (2) learner-to-instructor interaction, and (3) learner-to-content interaction [49]. It proved that the rise of student engagement could enhance satisfaction, motivation, and performance. At the same time, it decreased the sense of isolation in the online learning environment. Bolliger and Halupa (2018) clarified the finding that learners perceived online instruction as positive learning, satisfaction, and progression due to the good practice of online engagement [48]. Learners thought that online discussion could activate their thinking skills to be creative and analytic, thus producing meaningful work by motivation. In accordance with Buckley (2003), learners expressed that online discussion could activate their creative and analytic thinking skills, thereby producing meaningful work by motivation [47]. Satisfaction could be attributed to fulfilling learning needs. The result reported that online instruction fulfilled students' intrinsic needs in terms of SDT, thus resulting in a high satisfaction level [56]. A study showed that learning outcomes and retention showed no significant difference with traditional course [69]. The increase of learners' self-regulated learning and independent learning through online instruction resulted in considerable online learning outcomes with high self-motivation [70]. Providing detailed and useful feedback from instructors is essential to students, as they can be given constructive guidance, thus increasing their satisfaction and involvement [71]. From Wood and Keeler's (2001) finding, auto-email instructions were proven to increase group discussion and participation, resulting in a great sense of online community with high satisfaction level [37]. Online instruction promoted students' motivation, however, flexibility factor should be considered for students' satisfaction [72]. Respondents illustrated that they felt motivated with online instruction in terms of instructor feedback and peer interaction [73]. Based on Wu et al. (2020), students' writing could be improved by using online flipped writing instruction; hence, it enhanced satisfaction among the students [74]. Walker and Kelly (2007) revealed that students showed satisfaction toward work, assessment, and grading [75].

#### Effectiveness

Six examined articles held a positive perception of online instruction, as effective and immediate. These studies showed that online instruction was as effective as face-to-face instruction. No significant difference was found between online and face-to-face instructions regarding learning outcomes [22,54,55]. In the study conducted by Tichavsky et al. (2015), most students held a positive perception toward online instruction in comparison to face-to-face instruction; therefore, more effective online pedagogy should be developed [76]. Moreover, immediate feedback was one of the prominent reasons contributing to the effectiveness of online instruction. Based on the online instruction strategy (SI), students thought online instruction was effective because of timely and specific feedback [52]. A vast majority of students perceived that prompt feedback, especially responses to emails and questions and grade posting, were highly rated [53].

#### Good Engagement

Six examined articles reviewed good engagement, interaction, and participation as positive online instruction perceptions. Tsai, Ku, and Campbell (2021) indicated that engagement and learning outcomes were positively perceived by students who were in highly interactive courses, particularly high student–student and student–instructor interactions [77]. The research presented that both types of interaction played critical roles in online instruction with regard to approaches to online learning engagement [78]. Anonymity was perceived as one of the crucial elements that contributed to online instruc-

tion perceptions. Being anonymous in online activities increased students' participation in the discussion [38]. Learners' engagement could be closely related to a few factors, such as learner-centered instruction, learning style, and instructional design [79]. Regarding formative assessment as an online instruction intervention, students held a positive outlook toward engagement in online learning activities [106].

#### Ease of Navigation

Three empirical articles discussed ease of navigation as one of the optimistic perspectives perceived by learners in terms of online instruction. Online instruction was found to be helpful when using e-learning web-based modules by guiding them through navigation easily [80]. An online instruction rubric, QM, was developed to gather the perceptions of students, and the finding discovered that ease of navigation was rated highly among them [81]. In addition, learners found instruction in online navigation to be helpful and effective, as it included introduction to contents, web pages with suggested links, and assignments [82].

#### Comfort and Flexibility

Three empirical articles interpreted comfort as an optimistic reaction to online instruction. Receiving instructors' immediate feedback and reading other teams' posts could strengthen learners' reading comprehension, resulting in comfortable and understandable perceptions toward online instruction [51]. According to Sharp (2014), an indication of flexibility should be considered in an online learning environment to enhance student connectedness based on the CoI model [83]. Self-directed learning was perceived as a great option, particularly for female married students, due to societal norms dictating that traditional women are not allowed to participate in school programs. Moreover, some female students felt uncomfortable to take part in late night study groups with mostly male students; hence, self-directed learning could be a better alternative in an online learning environment [107].

#### Positive Online Experience

Two empirical articles stated the importance of positive online learning experience of online instruction. Ivers, Lee, and Carter-Wells (2005) suggested that a positive online learning experience should be created on the basis of students' online instruction perceptions, namely, interaction, instructional support, and prior experience with computers, to spur learning motivation and inclusiveness [84]. Most students favorably perceived that quality academic experience was enhanced through online instruction in comparison to traditional classroom [85].

#### Improvement of Learning Outcome

One empirical article explained that students substantially improved their learning outcome through instructional practice and support based on constructivism theory [86]. Blogging into writing instruction was useful in enhancing writing proficiency, fluency, and awareness of writing for audiences. [87].

#### Acceptance

One empirical article focused on the acceptance level to online instruction. Quality online instruction was favorably perceived by students, as it increased their acceptance level toward online learning [88].

#### 4.2.2. Unfavorable Online Instruction Perceptions

##### Lack of Interaction

Six empirical studies discussed the downside of the perspective toward ambiguous online instruction. Alternatively, empirical articles reflected the issue of online learning, which was lack of interaction, thus forming negative perceptions during online instruction.

As a consequence, it reduced direct involvement, thus becoming less personal. Cole, Shelley, and Swartz (2014) showed that although convenience was the reason that contributed to learners' satisfaction, lack of interaction was the main cause for dissatisfaction due to the online instruction in e-learning [89]. A study revealed that some participants expressed the importance of social presence in terms of open communication and group cohesion [90]. Borstorff and Lowe (2007) noted that little interaction and communication were concerned with instructors and other students, especially young learners who yearned for more interactions with other students than any other groups [91]. Most of the student engagement time dwindled to computer-based instructions and led to a fall in student success [92]. Students perceived online instruction negatively when instructors had very limited interactions with them, especially because it was their first time taking an Internet-based course [93]. Students perceived that the interactions with their instructors and peers had huge impacts on their satisfaction; however, student engagement was rated as the least satisfaction level due to the roles of instructors [94].

#### Ambiguous Instruction

Four empirical studies discussed the downside of the perspective toward ambiguous online instruction. None of the theoretical studies reflected the issue of ambiguous instruction, but four empirical studies explained the barrier faced during online instruction and how it influences students' perceptions. Armstrong (2011) argued that online learning became seemingly superficial without a clear instruction; as a result, it diminished the value of education and academia [95]. The agreement continued when a lack of clear expectations was regarded as one of the hurdles to online learning [3]. While online learning, students might experience complex feelings, including frustration and disappointment due to ambiguous instructions, thus affecting the relationship between instructors and students [96]. When unclear instructions were delivered, online learning became more sophisticated and challenging, especially those who require assistance from their instructors [97]. According to a study conducted by Hancock (2018), no significant differences were observed in students' perceptions of quality online instruction regarding instructor competency and teaching presence to students' intent to persist in school [98].

#### Lack of Technological Skills and Competency

Three empirical articles illustrated that technological skill competency was considered one of the online barriers that formed students' pessimistic perceptions during online learning. Being incompetent of using computers, the role of instructors in delivering effective online instruction was being questioned due to difficulty in communicating in a non-verbal manner and limited time of online learning [99]. Oh and Lim (2005) pointed out that competency in using computer technology could be a factor influencing online instruction perceptions to enjoy online learning [100]. Technology issues were frequently faced by online students, followed by clarity of communication and prompt feedback that would disrupt their online learning experience [25].

#### Lack of Support

Two empirical articles examined the drawback pertaining to types of support about online instruction perceptions. Similarly, the empirical studies identified two types of support: (1) instructional support and (2) technical support, endorsing the pessimistic perceptions toward online instruction. In terms of instructional support, a lack of pedagogical support during the online teaching process was perceived. In addition, instructional support referred to providing information and learning platforms in which it required technical support from online instruction [101]. Zwanch and Cribbs (2021) reported that students' concerns became worse when face-to-face instruction shifted to online instruction during the pandemic; therefore, support from their instructors was critical to scaffold their learning [102].

### Academic Dishonesty

One empirical article examined the aspect of academic dishonesty as one of the factors to shape students' online instruction perceptions. Students perceived that there could be potential for online cheating throughout the learning process [103].

#### 4.3. Factors Influencing Online Instruction Perceptions

Three main factors pertaining to online instruction perceptions were identified:

##### 4.3.1. Quality Instruction

Quality instruction must be clear, concise, and understandable to learners. Cognitivism indicates that online instruction should be brief and clean to reduce cognitive burden for online learners. The criteria of quality instruction are andragogical competency, resourcefulness, adequate preparation, effective organization and technological skills, content and currency of knowledge, and instructors' dispositional attributes [104]. Meanwhile, quality instruction is equivalent to clarity and effectiveness. One of the examples of quality instruction is to provide specific, constructive, detailed, and prompt feedback. It is aligned with behaviorism to monitor students' behavioral actions by giving suitable feedback. Based on a study in China, online formative assessment was viewed as effective to enhance student engagement and learning outcomes [105]. Researchers have endorsed the significance of feedback in several aspects, such as instructor's credibility of giving feedback [108], and the outcomes of cognitive and motor skills [109]. Many studies have shown that providing prompt and specific feedback not only strengthens learners' comprehension but also increases their motivation and satisfaction. As a result, it can lower learners' anxiety, thereby escalating the feeling of comfort during online learning.

Meanwhile, ambiguous instruction can cause learners' frustration, disappointment, and other complex feelings. As discussed by brain-based theory, learning is strongly attached to emotion; hence, the change in emotion can affect learning development. It can lead learners to negative online instruction perceptions, thus gradually losing interest and enthusiasm toward online learning. Several researches have drawn attention to the issue of ambiguous instruction in the learning process and its impact on learners [110,111]. Ambiguous instruction can be related to unclear instruction without a clear expectation. Consequently, students perceive online learning as challenging and demanding, whereby it can affect the relationship between instructors and learners and reduce online interaction over time. That is, ambiguous instruction may devalue online education and cause high dropout rate, particularly in the midst of the pandemic.

##### 4.3.2. Social Interaction

Social interaction is critical for effective communication in building good rapport between instructors and learners. Several studies related to the significance of social interaction have been identified across three countries, such as USA, England, and China. Moore (1993) revealed three types of interactions, namely, learner–learner, learner–instructor, and learner–content interactions [112]. Icebreaker discussion was rated the most significant engagement strategy in learner–learner interactions, followed by sending consistent emails as reminders or announcements in learner–instructor interactions and working on real-life scenarios, including presentations and reports, in learner–content interactions [49]. As such, developing a reference for social interaction in online social groups could promote online relationship [113]. Similarly, a study involving 667 students from three private universities in the USA was conducted using the Online Student Engagement Scale to measure student engagement [114]. The result showed that skills, emotions, and performances were positively perceived by students, except for participation [48]. The implication explained that student engagement in the online learning environment might be attributed to the seven best practices of online instruction [20]. To increase student engagement in group participation, a study in the USA found that audio-email instruction can be employed as supplement to text-based instruction to enhance a powerful sense of online commu-

nity [37]. Other than that, online discussion platforms, such as Facebook, can turn out to be promising tools to enhance online interaction [115]. A study on social interaction indicated that high student–student and high student–instructor interactions were favorably preferred by students toward their perceptions of engagement and academic performance in comparison to two other groups, such as low student–student but high student–instructor interactions and group discussions [77]. In England, a study on engagement approach noted that interaction was critically important to online instruction in terms of student motivation. Positive significant impact of interaction was found to motivate students in virtual learning [116].

Conversely, a lack of social interaction has contributed to the downsides of online instruction perceptions. The teacher role was the most important reason for student motivation, but this situation reduced student interaction due to the large class size [94]. Vygotsky's Zone of Proximal Development, Vygotsky's social constructivism, social learning theory, and activity theory focus on social interaction. Social interaction is critical in building trust, establishing relationships, and establishing a sense of belonging. Students connect their prior knowledge and construct new knowledge through social interaction [22,86]. Constructivism also suggests engaging in cooperative and collaborative learning to increase interactive learning and enhance thinking skills. Various online activities, including blogs and live room chats, should be utilized to enhance online interaction [117].

#### 4.3.3. Instructional and Technological Support

Instructional and technological support are critical to scaffold learning in facilitating learners' cognitive process in online learning. Much current and relevant consensus exists on instructional support [118] and technical support [119,120]. Instructional support can be a source of motivation to promote self-directed learning among learners. Correspondingly, heutagogy outlines the roles of learners as independent and active individuals to promote autonomy in learning. As such, sufficient instructional support is perceived as helpful and effective, making no significant difference between online and face-to-face instructions.

With regard to technological support, ease of navigation is found to be essential in online learning to guide learners to various types of online instruction, mostly web-based instruction, including Learning Management System and Schoology. In accordance with theories, connectivism promotes the use of technology to keep updated and innovative. Masrom (2007) demonstrated that online learning experience can tremendously impact the acceptance toward the use of technology in online learning [121]. Nonetheless, it may be sophisticated for learners who are experiencing some problems regarding technological skills and competency. It can propose numerous downsides that may lead to dissatisfaction. This situation may prohibit them from enjoying the pleasure offered during online learning and disrupt their learning, causing unfavorable online learning experience. Failing to interact with instructors and other learners may reduce their acceptance level toward online education and question the effectiveness of online instruction.

## 5. Discussion

In this section, both research questions are addressed to analyze and summarize the findings as follows:

RQ1: What are students' online instruction perceptions?

Quality instruction was highly rated for satisfaction and motivation levels, effectiveness, and comfort and acceptance toward online learning. Quality instruction accounted for students' favorable online instruction perceptions [50,51,53,59]. Examples of quality instruction were timely responses, constructive feedback, and immediate grade posting. However, without instructors' presence in giving prompt feedback, students might experience disappointment and dissatisfaction in accomplishing challenging tasks. To some extent, this situation might heighten stress and anxiety levels among students. As a result, health conditions were deteriorated for excessive use of ICT, particularly mental health.

Hence, quality instruction should come into practice in creating a healthy and conducive virtual learning environment [122].

Consequently, online interaction was given the second highest rating for students' positive online instruction perceptions. Good online engagement was critical in online instruction [49,76–78]. The findings suggested that increasing interaction through various online activities could have a great impact on the relationship between instructors and students, including live chat discussions, online quizzes, and online forums. For example, a research endorsed the usefulness of gamification, such as Quizizz and Kahoot!, in promoting better engagement and positive learning experience [123]. "Lack of communication" and "lack of interaction" were the most cited reasons that contributed to unpleasant learning experience. This finding suggested that online learning relied heavily on online instruction to construct knowledge and deliver relevant content in facilitating students' understanding and comprehension toward the online course. Three types of interactions were identified: student–student, instructor–student, and student–content interactions.

Most students evaluated instructional and technical support as significant to their academic performance and constant learning [25,99–102]. Students expressed their frustration and stress in dealing with software and hardware operations due to lack of technology competency. Fundamental ICT knowledge and skills should be acquired by learners to enjoy the pleasure of online learning. Moreover, preferences for learning styles related to technology were considered to increase students' fondness toward online instruction as a medium of communication during online learning. Students equipped with considerable ICT competence and skills showed a great sense of interest and community, thus yielding in satisfying learning outcomes. Instructional and technical support were useful and effective in providing assistance to students in terms of ease of navigation with supportive instruction.

RQ2: What are the factors influencing students' online instruction perceptions?

Several factors influencing students' perceptions toward online instruction were identified. Most students expressed their concerns about the transition from face-to-face instruction to online instruction. In some developing countries, the common circumstances frequently faced by students were Internet accessibility, university facilities, resources, and financial support. As a consequence, these unsolved issues might accumulate students' tension level in facing the exacerbation of their academic performance without instructors' actual teaching presence.

Instructors' online instructional practice was one of the determining factors that could impact students' attitudes related to motivation and autonomy. When designing online instruction, instructors should apply optimal instructional strategies that are compatible with students' ICT competency. Instructional strategies can stimulate students' self-regulation for better personal development. In addition, the design of online instructional activities should integrate with interactive elements, notably group discussion and communication, to enhance the interaction between instructors and students. Through online interaction, students' active participation may increase throughout the learning process.

The nature and format of the work were also influencing factors in assigning tasks after the instruction was given. Assigned work was strongly associated with grading, performance, and feedback. It could provide room for improvement and development among students. Thus, flexibility and convenience elements should be considered in assigning tasks to enable students to complete their work on the basis of their time availability and capability.

## 6. Conclusions

Overall, this scoping review examined 61 peer-reviewed studies on higher education students' online instruction perceptions pertaining to types of online instruction and research method. In this scoping review, 14 types of online instruction were identified, such as the seven principles of effective online instruction, web-based instruction, and comprehensive online instruction. With regard to the research method, qualitative research

was the most used for data collection, particularly surveys and questionnaires. Referring to the first research question, quality online instruction is evidently an opportunity to maintain students' enrollment in higher education, empowering educational opportunities and developing a more sustainable education around the globe. Online instruction can change teachers' new form of teaching delivery, improve virtual teaching mode implementation, and build a more student-centered approach in the education field. Upon reviewing and analyzing the articles, the findings revealed that instructors have played a significant role in creating a quality virtual learning environment, notably to enhance students' motivation and satisfaction in learning. Based on the second research question, some existing circumstances can be the barriers of putting quality online instruction in higher education into practice. Improving competency, skills, and knowledge in terms of delivering clear instruction and enhancing interaction can be a challenge for educators. Another hindrance of quality online instruction is the lack of technological skills among educators. It may cause some issues in online instruction delivery to engage students effectively. In achieving quality education as stated in one of UN's SDGs, the implementation of a successful virtual learning should be in line with quality online instruction to facilitate students' learning skills in terms of collaboration, creative thinking, critical thinking, and communication in the 21st century.

## 7. Implications for Future Research

From this scoping review, useful and effective curriculum pedagogy is critical to provide a clear educational proposal for future curriculum development. Lack of interactivity with instructors and peers is evidently the main contributor to students' stress and anxiety. To illustrate, students are less likely to engage in online instruction partly due to the failure of receiving constant academic feedback, assessing formative performance, and reaching for instructors' availability. Maintaining the relationship between instructors and students should be considered for quality communication during the learning process. In existing literature, strong evidence reveals that effective online instruction requires students to have self-discipline. That is, the arousal of intrinsic motivation mostly comes from self-regulation to inspire students to reach for higher academic achievement. It can promote self-determination to enhance students' critical and higher-order thinking skills. Thus, an online instructional design should be aligned with viable online activities that suit students' interests and learning styles.

Future research should also consider the importance of instructors' roles in addressing the issues identified in this scoping review. For an effective implementation of online instruction, an online instructional framework and an instructional design should be examined to bring a pedagogical value to the education field. Exposing educators to quality online instruction makes it possible for them to have a comprehensive understanding of how to plan their instructional design for curriculum transformation today. Proper guidelines about online instruction strategies and approaches are crucial to reinforce exceptional virtual learning experience in higher education.

## 8. Limitations

This scoping review utilized specific inclusion and exclusion criteria through three main databases, namely, Google Scholar, ERIC, and Research Gate, to retrieve identified articles under the narrow scope. Due to particular inclusion and exclusion criteria, some articles were excluded for reviewing purpose in terms of the selection of articles. Therefore, potential articles in other databases, such as Scopus and SAGE Journals, should be extended to provide comprehensive findings as a whole. This review also examined empirical papers from several countries, such as the USA, Indonesia, Taiwan, Turkey, Korea, Norman, England, and Malaysia. However, more than 60% of the reviewed articles were retrieved from the USA, showing a limited coverage of other countries, such as China and Russia. A limited coverage of studies in Malaysia that focus on higher education students' online instruction perceptions was also observed. Hence, most studies are from foreign countries.

To present a board and inclusive finding, reviewed articles should include other countries, as it may produce slightly different data analysis. In addition, in-service and pre-service teachers were chosen as research participants in most studies exploring online instruction perceptions compared with higher education studies. Many studies also center on online learning, e-learning, online discussion, and online interaction, restricting the number of works that concentrate on students' online instruction perceptions. In future research, all suggestions should be considered to balance practicality with available resources for revealing further evident and relevant findings in the scoping review.

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