

A Review on E-learning and Employability Skills

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Abstract

This study presents a systematic literature review to ascertain the extent of exploration of e-learning and employability in extant research. Through a systematic review of literature published between 2008 and 2022, the author analyzed 88 articles published in 67 academic journals. The following were identified: key publishers, publication trend and citation, most contributing research areas, major contributing countries, leading researchers, major methodological approaches, key focus of studies and major outcomes. Future research prospects are also discussed. Study reviewed the impact of e-learning to employability, examining various areas, publications, citations, countries, and authors publishing e-learning and employability research. The present study explored the types of data collection method used, statistical analyses performed, and contributions of e-learning and employability skills literature in terms of their purpose and outcomes. Investigation observed that most of the research on this topic has indicated a positive impact of e-learning in enhancing the employability skills of higher education students. Additionally, this study provides insights to future researchers to address other potential factors that might influence employability and evaluate digital learning techniques that can meet the needs of diverse sections of society. Study reveals significant gaps in research, which can advance this significant research agenda for future investigation. This would facilitate highlighting the unexplored aspects of e-learning and employability. The topic of review is a cross-disciplinary research area, attracting scholars from different domains.

Keywords: E-Learning, Employability Skills, Higher Education, Systematic Review Literature.

Introduction

Previous studies have enumerated numerous advantages of e-learning, such as effective interaction, cost- and time-effective, fulfillment of learners' special needs, accessibility of resources, development of self-study skill, motivation and satisfaction, ease of tracking attendance, and opportunity to learn for work-based people stressed on online learning for enhancing employability in higher education stated that "the development, and assessment of employability skills, such as oral communication and teamwork skills continues to be possible in an online teaching environment" (1-5). Related to employability skills, a famous definition by Yorke (6) states as follows: "the set of achievements-skills, understandings and personal attributes-that makes graduates more likely to gain employment and be successful in their chosen occupations, which benefits themselves, the workforce, the community, and the economy." According to an author (7), "Employability skills are suggested to be a set of necessary key skills or attributes related to required activity from an employer, so that is

connected to the specific skills within the subject, sector, company, or other specific requirements." Although there is no specific definition of employability, there is a general agreement that the concept is focused on work and the ability to get the job. An individual's capability to obtain employment is defined as employability, and depends on the knowledge, skills, and attitudes of this person (8). A vital issue related to the definition of learning goals is the identification of attributes that truly prepare an individual to enter the labor market. The new labor market needs graduates to have a different attitude toward career management as the expectation of a "job for life" has lost its meaning in the context of organizational changes. Thus, the roles of education and training are critical in preparing students for an active working life. As agents of education and training at the tertiary level, universities are required to devise new educational and training models, which can increase access to work and improve graduates' work performance (9).

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As scholars have deeply examined the increasing trend of online and digital supported methods in higher education and its contribution in developing and enhancing the employability skills (Table 4), it has attracted researchers to this vital research field. In this context, the association between e-learning and employability has not received adequate academic attention, necessitating more research in this area. Therefore, author systematically reviewed the literature, which could be especially helpful to junior researchers in understanding the kind of

methods that have been already used, and how different aspects of e-learning in relation to employability have been explored thus far. Hence, this approach will be useful for researchers to identify research gaps with respect to methodology and pattern based on the collected information.

Based upon 88 articles reviewed, a theoretical framework (Figure 1) has been formed to account for the role of e-learning on the job skills of learners.



Figure 1: Theoretical Framework

The purpose of this study to present a systematic review of e-learning and its impact on employability skill research that exhibits the focus areas of previous research and identifies whether certain aspects have remained under noticed. This leads us to pose the following question: what has been empirically investigated regarding e-learning's impact on employability to date, and what should be the direction of future research? The study progresses in four main phases. First, it draws on the main concepts from the research focusing on e-learning's impact on employability and establish a conceptual framework for this review. Second, study outline methodology. Third, it presents the findings of systematic review and identifies the key insights and gaps in literature. Fourth, conclude by presenting avenues for upcoming research.

A systematic literature review was conducted to interpret the overall understanding of this research domain. The systematic process is as follows:

For this review, studies were retrieved from the Clarivate Analytics' Web of Science core collection. In selection process, author searched titles, topics, and abstracts using different keywords. The search was based on the following keywords: e-learning and employability, virtual learning and employability, online learning and employability, web-based learning and employability, blended learning and employability, and Learning Management System (LMS) and employability. Under the inclusion criteria, as this topic is less explored and lacks comprehensive literature, author included all years that appeared in the

database so that this study could cover the entire period where e-learning's impact on employability has been discussed. The result yielded 416 documents: 219 proceeding papers and 197 articles. As author aimed to review "research articles" in "English language," which has resulted to total 188 articles. While in exclusion criteria, study excluded articles that did not directly or indirectly contribute to research questions and were therefore removed. So, author restricted this number to 88 articles only, which was directly and indirectly related to the relationship between e-learning and employability based on research question. Figure 2 shows the entire process.

To find potentially relevant studies, author select a methodology to identify articles related to theme of the study. Hence, three rounds were performed to select the articles for review. The first round of analysis involved screening of the title and abstract. In the second round, studies other than articles and those published in English were eliminated. Study analyzed the articles, and selection criteria was based on research question. In the third round, studies were retrieved for a comprehensive examination to decide on inclusion in this study. To address specific research questions, review excluded articles that have not discussed the impact of e-learning on employability skills. A search based on the inclusion criteria yielded 188 articles. After applying the exclusion criteria, author narrowed this number to 88 articles relevant to the present systematic review of the literature. Accordingly, titles and abstracts were reviewed by the researchers, who used the above-mentioned

criteria to determine the eligibility of the papers to be included in the study. A study mentions (10), “A systematic review article can be developed using 40–50 to 500 or more relevant papers.” Therefore,

after skimming all articles, 88 were finalized as representative of research on e-learning and employability. Findings extracted from each study and major were recorded in evidence Table 4.

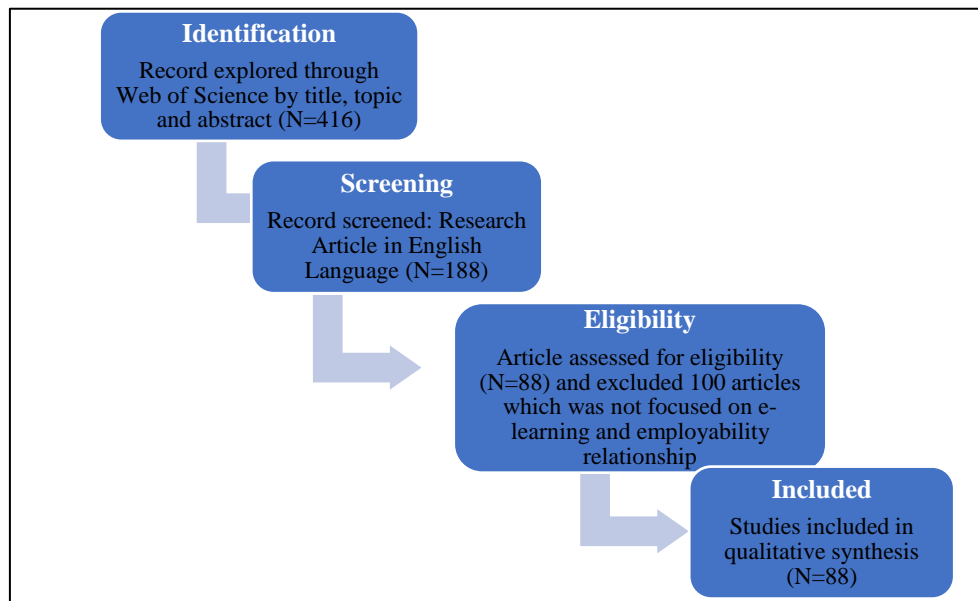


Figure 2: Article Search and Selection Procedure

The review tried to explore eligible studies as possible. Study used various search terms and authentic databases. However, to restrict the search to prominent databases acknowledged by their quality and insights to science to guarantee the rigor and quality of the studies included in review; however, this led to a selection of only 88 papers representing 36 countries. The inclusion of various studies from a broader database could provide varying outcomes. The search terms were as follows: E-learning and employability, virtual learning and employability, online learning and employability, web-based learning and employability, blended learning and employability, and LMS and employability. The author develops insights into the impact of e-learning on employability with the given results. However, there could have been additional keywords for this type of topic. Additionally, more studies from a broader selection of databases can provide an extended analysis of this particular area of research. In spite of that the role of e-learning on employability is significant as majority of the articles have been found showing positive relation between them. Therefore, there is less potential for biased outcome when such authentic databases

and systematic procedures have been opted by researchers.

Findings of systematic review literature are organized in three sections. First, study reviewed the overall contributions of e-learning and employability, examining various areas, publication trends, citations, countries, and authors publishing e-learning and employability research. Second, the methodological aspects of articles obtained in search were reviewed; this includes the types of data collection method used and statistical analyses performed. Third, author reviewed the contributions of e-learning and employability skills literature in terms of their purpose and outcomes.

Review of E-Learning and Employability Study Contributions

E-learning and employability research has been conducted in multiple domains, which enables a multidisciplinary approach. The top-10 research areas are shown in Figure 3. Most of the studies are conducted in higher education; among them, the education department is the topmost domain to pursue this research topic, followed by business economics, computer science, psychology, engineering, and environmental science.

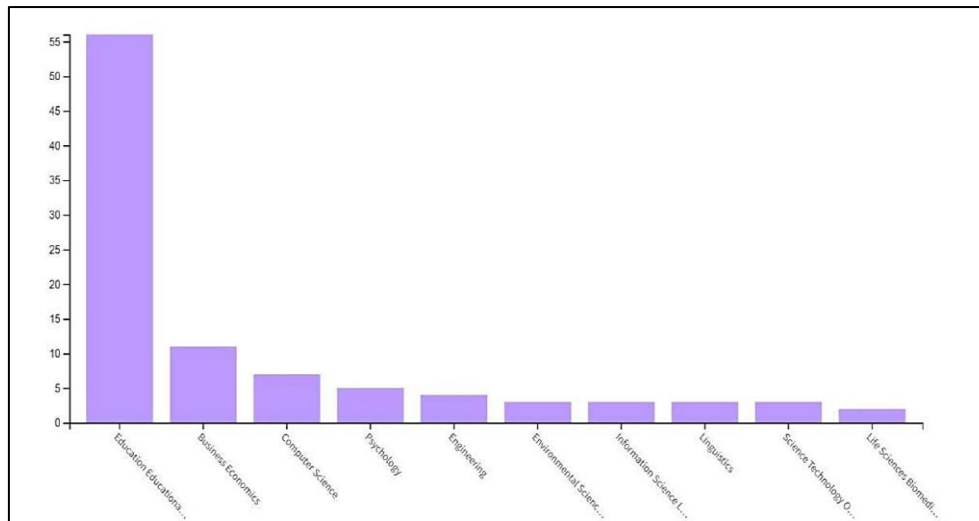


Figure 3: Top-10 Research Areas in E-Learning and Employability Research (2008–2022)

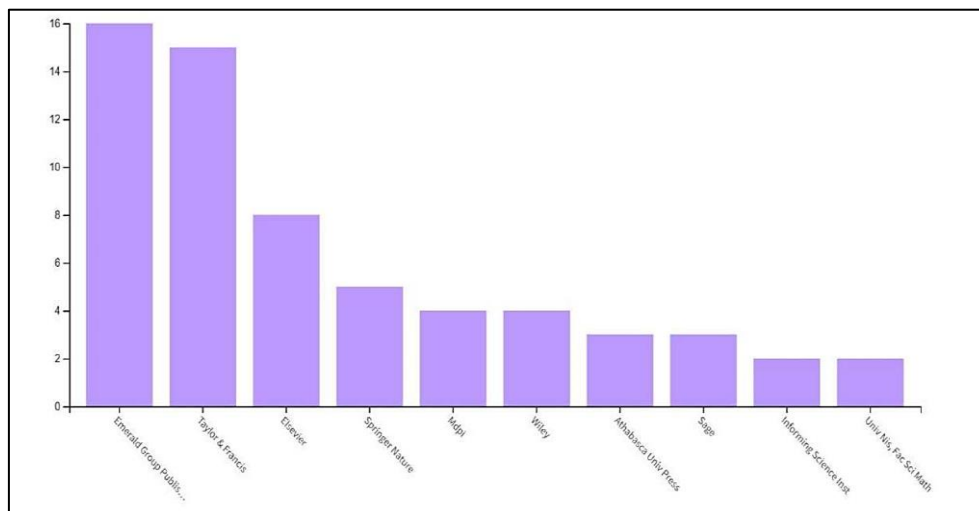


Figure 4: Top-10 Publishers of E-Learning and Employability Research (2008–2022)

The review explored that e-learning and employability research was published in 66 different refereed academic journals. Studies list the top-10 publishers in Figure 4—the Emerald group has published the maximum number of articles on e-learning and employability. Taylor and Francis published the second largest volume of e-learning and employability literature, followed by Elsevier, Springer Nature, MDPI, Wiley, Athabasca University Press, Sage, Informing Science Institute, University of Niš, and Fac Sci Math. The number of articles published annually in the field of e-learning and employability research is steadily increasing, with more citations than in the previous year, as shown in Figure 4. Interestingly, Figure 5 shows a considerable increase in the number of e-learning and employability articles published during the 2018–2022 period: 24 articles were published before

2018; 64 after 2018. Based on Table 4, study can summarize that this dramatic increase is the result of increased investigation of various online tools and methods and their effectiveness in improving students' skills. Studies during this period emphasized analyzing the impact of blended learning, Massive Open Online Course (MOOC), Virtual Reality and Augmented Reality VR/AR, virtual field trips, online role play activities, visual tools, flipped classroom environment, Edu-Cloud, Mobile X-Space classrooms, and vignette approach of current emergent technologies, as well as online learning during the Covid-19 pandemic and the use of certain virtual techniques in higher education. These phenomena have catalyzed the research interest in e-learning and its impact on improving students' skill over time, allowing greater access to data for scholars interested in this area of study. It determines the vitality and relevance of the study.

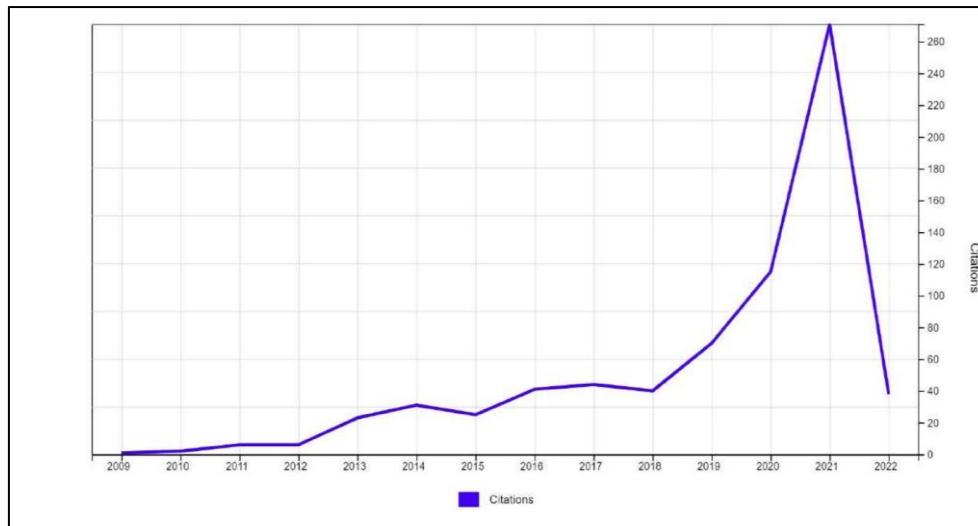


Figure 5: Citations in E-Learning and Employability Research (2008-2022)

A wide variety of researchers have contributed to the e-learning and employability literature, highlighting the diverse and eclectic nature of this field of research. Additionally, this study area has significantly benefited from the extensive contributions of researchers from myriad domains, who have helped advance the knowledge in this sphere. Figure 6 shows that Martinez Cerda JF and Torrent Cellens J hold the top position in e-

learning and employability research, followed by Bodia CN, Dascalu, and Gonzalez. E-learning and employability was investigated in 36 countries. Figure 7 shows top-10 countries where the maximum work in this field has been performed. Australia tops the list with 18 studies, followed by England, Spain, the Netherlands, the USA, Canada, India, and Malaysia.

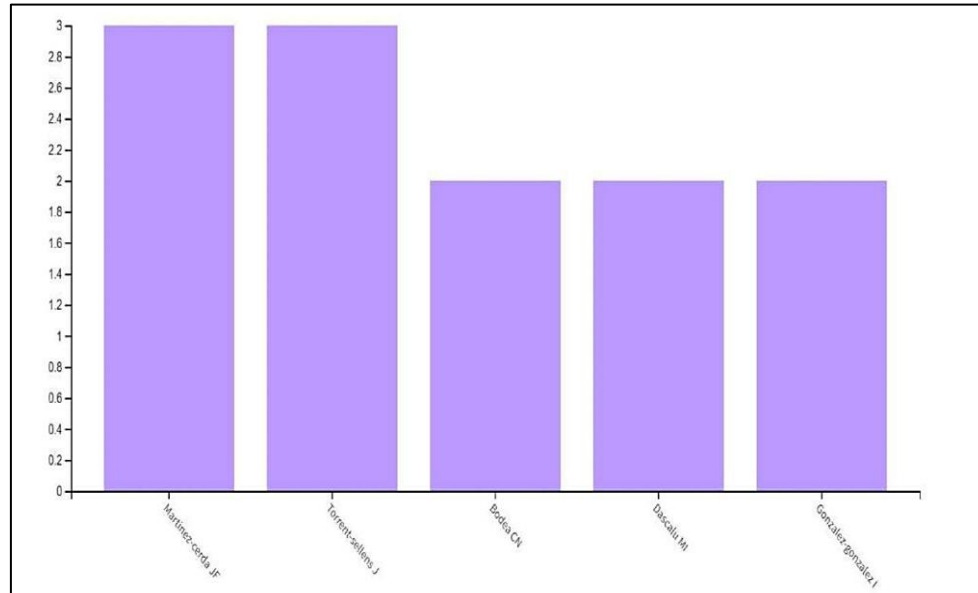


Figure 6: Top Researcher in E-Learning and Employability Research (2008-2022)

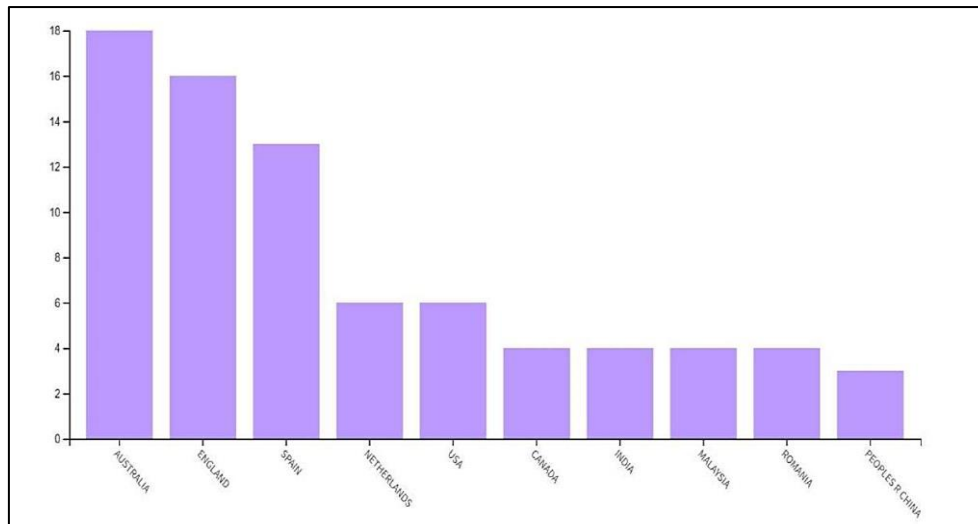


Figure 7: Top-10 Countries that Contributed to E-Learning and Employability Research (2008–2022)

Review of E-Learning and Employability Study Methods

Review identified that 68 articles have used primary data to assess the impact of new teaching modes, including e-learning tools and methods, on students’ skills; 19 studies have used secondary data. As primary data is more informative, most of the studies have used primary data to analyze the impact of e-learning on employability skills. The study explored that the higher education sector was most frequently investigated in terms of e-learning and employability skills. Table 1 lists the entities evaluated, indicating that e-learning and employability studies have mainly focused on the higher education sector—76 out of 88 studies investigated higher education students. Ten studies explored employers, citizens, migrant, and

disabled people; one study analyzed primary and secondary school education.

In terms of the data collection method, survey, case studies, personal interview, and observations are the most popular methods. A total of 13 studies are based on a combination of research methods and techniques. Table 2 summarizes the research methods most commonly used.

Study identified that the statistical method most commonly used in e-learning and employability research is ANOVA. Percentage analysis was used in 11 studies; additionally, regression analysis, t-test, and EFA were widely used. This type of analysis is logical for studies examining the impact of e-learning on employability. A summary of the statistical methods used in selected studies is presented in Table 3.

Table 1: Entities Examined in E-Learning and Employability Research (2008–2022)

Focus of Research	Number of Articles
Higher Education	76
Others; employer, youth, citizens, migrant workers, managers, trainees, community-knowledge workers, less-educated people, flexi workers, old age people etc.	11
Primary and secondary school education	1

Table 2: Top-5 Data Collection Methods Used in E-Learning and Employability Research (2008–2022)

Method	Number of Articles
Survey	37
Case Study	17
Interview	14
Mixed Method	13
Observation	3

Table 3: Top-5 Statistical Methods Used in E-Learning and Employability Research (2008–2022)

Analysis	Number of Articles
ANOVA	17
Percentage method	11
Regression	10
<i>t</i> -test	7
EFA	7

Purpose of Selected Studies and their Outcomes in E-Learning and Employability Study

Author analyzed 88 studies and presented their purpose and outcomes to identify their major contributions to e-learning and employability research; Table IV summarizes the key insights. Based on these findings, study organized the existing research to identify major focus areas of

research. The primary emphasis is on the analysis of the impact of e-learning's supported model used in study programs to improve students' employability. The secondary focus is on the utility of online tools and technologies in flipped classrooms to enhance lifelong learning to improve students' job skills. The third major emphasize is on the use of technology in the form of e-portfolio for skills enhancement and e-learning environment to support work integrated learning (WIL) placement.

Table 4: Contributions of E-Learning and Employability Skills Literature in Terms of Their Purpose and Outcomes

Selected major e-learning and employability Studies chronologically	Research Purpose	Outcome
Herman and Kirkup (11)	To assess the use of Electronic Portfolio (e-portfolio) for job to women (11)	The development of an e-portfolio within the course and assessment for target group has been found highly successful (11).
Vilar and Žumer (12)	To identify the library science courses supported by online learning(web2.0) effectiveness in employability (12)	It could not assess the usefulness on employability. As newly educated staff has not yet entered the labor market (12).
Litchfield <i>et al.</i> , (13)	To facilitate an overview of the project's course renewal strategy of 'contextualized by the profession and integrated into the curriculum (13)	Study specifically provided the information about strategy and website (13)
Witney and Smallbone (14)	To assess the experience of undergraduate students used a wiki tool to assist group assessments (14)	Study found Student preference for traditional face-to-face co-operative working is a major barrier to the effective impact of on-line tools (14)
Oliver and Whelan (15)	To know iPortfolio effectiveness in employability (15)	Research found that tools such as the iPortfolio can be created for 'future proofing' and sustainability (15)
Falk <i>et al.</i> , (8)	To promote e-learning supported model to enhance employability in also disadvantaged section of society (8)	Study identified enhanced information and knowledge about gender theory and its implication related to job and the client-centered aspect (8)

von Konsky and Oliver (16)	To know the iPortfolio accounts, and variables leading to uptake and impactful use (16)	Study found an opportunity for students to show these attributes for possible employers (16)
Silva <i>et al.</i> , (9)	The research focused on the job skills, these skills to be developed in virtual undergraduate degrees (9)	Research explored the enhanced learning (9)
Duncan <i>et al.</i> , (17)	Study examined experiences of virtual problem-based learning in those new to online learning (17)	Online problem-based learning was found as beneficial to develop ideas and analyze information. However, the artificial nature of the discussion board space has been found barrier for some students (17)
Whittle and Bickerdike (18)	To explore effects of launching digital multimedia practical support tools on biochemistry and biological sciences for first year students' academic success (18)	Study found increased performance (18)
Storm <i>et al.</i> , (19)	To analyze e-learning type supported learning on work-related learning affected certain groups of employees and their health (19)	Study identified that online learning supported learning has the capability to impact positively the health of the relevant groups by providing their (continued) participation in the labor market (19)
García <i>et al.</i> , (20)	To explore that in blended learning, online learning is more impacting the employability positively than Face to Face (20)	Study found that teamwork soft skills meet higher achievement levels through the Evalsoft system in a blended-learning environment than in the traditional classroom (20)
Veld <i>et al.</i> , (21)	The understand the pros and cons of home-to-work spillover, home-to-work facilitation (HWF) and home-to-work conflict (HWC) with job skills (21)	HWF was found suitable related to anticipation and optimization only, while HWC found not helpful with all employability dimensions (21)
Schech <i>et al.</i> , (22)	The purpose is to suggest the power of information and communications technologies (ICT) to have global opportunities (22)	Study suggested Positive outcome (22)
KarapetJana <i>et al.</i> , (23)	To identify the skills and competences required by the labour market in dentistry and, employability (23)	The majority of the respondents who had used a Virtual learning environment were satisfied (23)
Martínez and Torrent (24)	To identify the impact of formal e-learning on measuring employment level (24)	Formal lifelong online education have been found helpful even during the time of economic crisis. (24)
Cheb and Rayess (25)	To show a particular outline of the library policy makers' view and the hiring patterns and acceptability of online library science degree holders in academic libraries across the Arab world (25)	The study found no major relationship between both factors. (25)
Dascalu <i>et al.</i> , (26)	To explore the current social and semantic technologies for upscaling job skills (26)	The current social and semantic technologies Positive outcome found helpful (26)

Starcic (27)	To examine students' behavior regarding the use of social network sites SNSs business competences and professional skill development (27)	The research identified successful result of using SNSs (27)
Gilar-Corb <i>et al.</i> , (28)	To verify the effectiveness of methodologies FOR EMOTIONAL SKILLS, supported in ICTs (28)	All three offered modalities: classroom, online, and coaching found effective (28)
Skagen <i>et al.</i> , (29)	The application of online collaborative assignments (OCAs) between two countries (USA, Canada), was analyzed for impact on learners (29)	OCAs are found critical tool for students to enhance professional identity (29)
Chib and Wardoyo (30)	To stress on open learning specifically for low-income female migrant domestic workers as a marginalized section of society (30)	The workers skills have been enhanced (30)
Martínez-Cerdá <i>et al.</i> , (31)	To assess the skills obtained through e-learning and validates the Socio-Technical E-learning Employability System of Measurement (STELEM) framework (31)	Study proved its validity for understanding lifelong e-learning for job skills (31)
Mee <i>et al.</i> , (32)	To investigate the effectiveness of MOOC learning (32)	Mandarin Massive online learning course developed information gaining skill' and 'system and technology skill'(32)
Bacilieri (33)	To exhibit examples of technology-enhanced teaching and data analysis on how these were applied to grow the quality of the student involvement with regards to art-related assessment activities, student-teacher interaction and evaluating of student progress (33)	Research revealed the positive outcome (33)
Latiff <i>et al.</i> , (34)	The "E.X.P.E.R.T" role play technique was checked for skills (34)	The "E.X.P.E.R.T" role play was helpful to create prospects for future professionalism (34)
Leong <i>et al.</i> , (35)	To identify the impact of learning space design and teaching methods on undergraduate students' collaborative learning attributes in the Mobile X-Space classroom also future job skills (35)	Study found enhanced skills (35)
Trede and Mahinroosta (36)	To show, online mechanism to host supervisors was formed for an innovative, application-based engineering degree (36)	The outcome showed skills found increased. (36)
Moore (37)	To check online exam for increasing employability (37)	The online exam identified as a helpful method (37)
Griffiths <i>et al.</i> , (38)	To understand flipped program and impact on employability (38)	Study shows multiple merits of flipped mechanism (38)
Shahzadi <i>et al.</i> , (39)	To offer the edu-cloud approach that would facilitate for specific learning	The offered approach is significant to enhance the cloud users experience in a multi-cloud environment (39)

	needs of a group of globally interconnected students (39)	
Valds and Santa (40)	To assess novel teaching approaches for enhancing employability (40)	Finding shows the employability has increased (40)
Hayes and Graham (41)	Explored the success of digital technology into a Pre-Registration Nursing degree program (41)	Study shows its effectiveness (41)
Murillo-Zamorano <i>et al.</i> , (42)	To check virtually supported flipped classroom effectiveness (42)	Finding proved the better skills and engagement (42)
Klein and Lewandowski-Cox (43)	To know how Australian music technology courses can enhance job skills (43)	Outcome was not found positive for music course. (43)
Hyett <i>et al.</i> , (44)	To assess an online intercultural learning activity with Australian and Hong Kong undergraduate professional therapy and oral health students to explore cultural attributes. (44)	The cultural competency has been improved (44)
Maxwell and Armellini (45)	To analyze students' understanding of technology and its applicability in work environments (45)	Positive outcome (45)
Nachatar Singh <i>et al.</i> , (46)	To assess Flipped classroom environment effectiveness and employability (46)	Study revealed that various skills have been improved (46)
Ornellas <i>et al.</i> , (47)	To know the ways to increase new graduates' job skills by connecting higher education curricula and the demands of the real world (47)	Strategy promoted the skills (47)
Sheridan <i>et al.</i> , (48)	To examine students' view on performance from, undertaking virtual theoretical instruction concurrent with WIL placements (48)	The theoretical learning and WIL reflective assessment online, found very vital (48)
Chowdhury (3)	To know how an online hydrology curriculum can adopt industry practice and involve students in to achieve learning outcomes (3)	Online students supported by the flexibility and multiple tasks (3)
Boulougouris <i>et al.</i> , (49)	To understand effect of blended learning on skills and employability (49)	Blended learning has been found effective (49)
Luka (50)	To check online learning in skills (50)	Online learning has supported in skill enhancement (50)
Ahmad (51)	To analyze the potential space scenario framework and a vignette approach of latest methods in higher education (51)	Study suggested that Automation, artificial intelligence, and the advent of 5G network tools will increase adaptability in higher education outcome and revolutionize the working culture in the immediate future (51)
Gamlath and Wilson (52)	To exhibit suitable literature to offer the categorization of the diverse knowledge-sharing activities (52)	Authors suggested online tool along with other tools will be useful in higher education (52)

Martínez-Cerdá <i>et al.</i> , (53)	To assess social-technical system (STS), the learning and social innovation via STS, and ICT-space-time continuum regards to the learners' methods of studying and their effect (53)	Study showed significant positive effects on employability (53)
Dyki <i>et al.</i> , (5)	To check online assessment to develop and reflect students' skills (5)	The assessment of these skills has offered students an artifact that can be suitable to show these skills (5)
Jackson <i>et al.</i> , (54)	To know industry trends'for learning contexts (54)	Industry 4.0 trends were particularly impactful (54)
Martín-García <i>et al.</i> , (55)	To assess the effectiveness of visual tools on academic performance, job attributes and student satisfaction (55)	Visual tools were effective (55)
Liashenko and Hnapovska (7)	To describe the major characteristics of employability in online training (7)	The critical thinking helped with professional competence, and increases job skills. However, the factor of communication is not vitally expressed in online education (7)
Silva <i>et al.</i> , (56)	To assess the impact of Digital technologies in education (56)	Study explored the creation of new teaching and learning opportunities that promoted employability (57)
ElAtia <i>et al.</i> , (57)	To understand online assessment tools to check employability (57)	Online assessment was helpful (57)
Winchester and Piggott (58)	To identify the dependence on physical WIL placements (58)	Study suggested technology supported learning in higher education (58)
Ceschi <i>et al.</i> , (59)	To present an overview of the past 20 years of lifelong learning policies for employability (59)	Study prescribed possible methods to support policymakers, as they can genuinely impact major competence development (59)
Irwin <i>et al.</i> , (60)	The know the effect of online internship and job attributes (60)	Online internships were found as valid, flexible, work experience, linked to skill enhancement and likely to improve student employability (60)
Castro-Lopez <i>et al.</i> , (61)	To identify the effectiveness of quality of blended learning.	Study shows the lecturers how to adapt their curriculum practices as per students' expectations of employability (61)
Shreenath and Manjunath (62)	To check the impact of learning on VR, and enhancing the job attributes undergraduate engineering students in India (62)	Virtual Reality found helpful method for enhancing the employability (62)
Patiar <i>et al.</i> , (63)	To check the acquisition of knowledge and skills with a VFT platform (63)	VFT is an effective technological learning tool for the acquisition of knowledge and skills in hospitality (63)
Neştian <i>et al.</i> , (64)	To assess knowledge management of business students in a digital education pattern so as to identify its impacts on students' opinion of both their career	The business students did not adapt their knowledge acquisition process in online education in a manner that positively influences business

	adaptability, and prospects in online businesses (64)	students' perception of their chances of employment. (64)
Chan and Wong (65)	To examine students, view on four different reflective approaches and how these are applied at higher education and employability (65)	Research shows that students liked more face-to-face and written reflections (65)
Andrienko <i>et al.</i> , (66)	To the impact of virtual team learning on the development of intercultural business skills highly required and valued by organizations (66)	Team learning in online teams has positive impact in uplifting employability skills (66)
Yukhymets <i>et al.</i> , (67)	To show that video is a successful educational instrument for avoiding psychological challenges in blended virtual learning during COVID-19 (67)	Research identified positive outcome (67)
Aman <i>et al.</i> , (2)	To analyze the role of e-learning on students 'employability (2)	Study identified positive outcome (2)

The findings indicate that LMS tools are very useful for the improvement of student skills. Authors (20) pointed out that some communication tools such as forums and wikis contributed to learning and skill development. Tools facilitated learning by doing, such as searching, questioning, and exploring, which enhance students' co-responsibility in teamwork. In addition, a study also supported this finding that verbal communication and teamwork skills can be successfully develop in virtual environment (5). Furthermore, authors (66, 67) claimed that virtual team learning was very helpful in enhancing multiple job skills. In terms of communication, some studies have asserted that online learning helps international students learn better English and develop employability skills. Studies have identified that e-learning is suitable for enhancing communication skills, self-learning, self-management, teamwork, etc. According to authors (46), prior studies found international students disengaged in the classroom mainly due to English proficiency level. However, the authors further claimed that a range of online activities in flipped classrooms assist students to take responsibility for their learning and hence develop transferable skills, such as thinking, learning, teamwork, and research skills. Self-learning was also found to be an important achievement in e-learning. In addition, research revealed a new aspect of e-learning that students experienced: skills such as soft skills were not taught by instructors. Instead,

it is something they need to develop by themselves to excel in studies as well as growth at workplace. This review found that e-learning is not only restricted to enhancing skills for language students or international students but also contributes to other domains such as accounting, geography, maritime education, music, law, business, science, technology, engineering and mathematics education (47). This study shows that blended learning/mixed methods of teaching have also been immensely discussed by various researchers focusing on employability. Thus, authors (49) favored the combination of blended learning using ICT, and the development of courses that shows the real requirement of the industry can be a perfect option to involve students. In addition, study found that various articles have particularly mentioned e-portfolios. The findings proved their success in enhancing student job skills. Authors (16) stated that an e-portfolio represents an opportunity to consider more authentic forms of assessment that reflect the skills and capabilities required in the workplace. Further, a study claimed that integrating the development of an e-portfolio within the curriculum and assessment has proven to be highly successful in enhancing employment skills (11). A study argue that e-portfolios also present an opportunity for students to exhibit these attributes to potential employers (16). In addition, some articles have highlighted different online tools and methods, found to be very effective in improving the employability skills of students, such as OCAs, MOOC, Mobile X-Space,

flipped classrooms supported by an online environment, VFT and AR/VR. In this review, some studies explored and presented very useful frameworks/programs to develop various employability skills demanded in the 21st century supported by online learning. For example, authors (31) presented Socio-Technical E-learning Employability System of Measurement, which proved to be helpful as a tool for modeling public initiative and labor policies related to job and social inclusion via lifelong online training. Another program, In TecEdu, was described by Silva (56) for the integration of digital technologies, which can help promote vocation and encourage entrepreneurship. Authors (48) found Work-Integrated Learning with Content and Assessment Online (WILCAO), which is a very viable framework that combines theoretical learning and WIL reflective assessment online. The author strongly favored this approach to online as a “de-situated” enabling students to be engaged in university learning virtually while being physically present at the workplace. WILCAO was found to be effective in achieving both university and workplace learner environments. Authors (45) states “a ChANGE framework that can help foster individual employability skills in general, and graduate employability skills in particular.” The findings show that online learning is a life-changing platform for adults who do not have tertiary education as well as those who are digitally excluded from unemployed citizens. Luka (50) focused on continuous adult learning, that is, a need for expanding globalization and aging populations in many parts of the world. Therefore, individuals must rely on consistent professional development to remain competitive. Online learning courses, including blended learning, are suitable in this scenario. Remarkably, an article presented by Martínez-Cerdá and Torrent-Sellens (24) underlines that during the crisis, formal lifelong online learning proved to be successful in obtaining employment for those who did not have higher education. The authors highlighted that formal lifelong e-learning is a good strategy for having more stable employment. An author remark that online training for teachers is an effective method for developing students’ critical thinking and problem-solving skills. However, very few studies were found in the review on teachers to support employability in a digital environment

(7). On the other hand, regarding the efficacy of e-learning in improving employability skills, few studies (8, 15, 49, 51, 67) come across with multiple barriers of e-learning system that hinders the positive impact in enhancing job skill. For instance, technical issues in the application and functions of online tools, slow speed of internet, old version of the programs, technical requirements, need of timely technical support, availability of tools as per the changing environment, applications of tools, as well as accessibility of online resources. To consider abovementioned issues, studies have also suggested in their studies very critical points to facilitate the e-learning environment.

Therefore, the review has explored highly recommended factors in various studies for increasing and updating programs and technologies for better accessibility of e-learning resources. Studies, (8, 49) advised that e-learning applications sometimes encounter difficulties when fulfilling technical requirements and technical support. The authors have suggested a continuous update of the educational material. Studies advised having accessibility, affordability of technologies, and enough staff to effectively run classes in online learning. An article pointed out that in a rapidly changing environment, designing and building tools pose a big challenge (15). A study specifically mentioned that before implementing blended learning/teaching, Internet speed, the file size of the video content, and availability of video cameras are essential for students’ interest when learning speaking in a language course (67). In this review, findings further highlight few recommendations to improve online learning’s role in enhancing employability of learners. A study (51) stress that higher education planning should add and prepare for this more likely future potential by adopting different ways that can leverage the quintessential advantages of 5G technologies. The study focuses that higher education can possibly benefit the future by utilizing the value propositions of 5G, which will enable the online future of education and research prospects. Hence, a shared vision incorporating the human factor will have to be built around the technology and the demand for 21st-century skills to prove students meet the challenges of a new work environment. Various studies have also considered employer and job

market needs. For example, an author suggested online training for educators to develop job skills among students and meet the demands of employers (7). This study highlights the need for educators to understand the significance and components of professional learning that aim to increase the professional factor for successful employability. A study (49) recommends strong connections between education and the job market. Another article provided insight into a training model of basic digital competencies for reducing unemployment (50). The author advised adult learners that learning must be based on classic adult learning principles and supported by the analysis of certain sociocultural contexts, learners' backgrounds, needs, motivations, and learning styles. Further it has suggested that public policy should aim to improve human capital (24). In this sense, future training plans that customize the type of educational methodology are required. It has reported that many higher-education graduates find difficulties when they enter the labor market due to obsolete curricula, relying on more theory, and lack of practical knowledge. Hence, the application of concepts has been suggested by various studies. As authors (64) argued, the application of knowledge in online education is the most important factor that could increase students' perception of employability in labor market (47). As a final remark, it is important to acknowledge that e-learning is very supportive in developing and enhancing student employability skills. E-learning helps universities to be more innovative and responsive to the evolving demands of students and the dynamic requirements of business and industry. The findings suggest that continuous updates of educational material, tools, and technologies, better access to digital resources, Internet speed, and so forth are urgently required in higher education to advance their learning system. In addition, training should be provided to educators to develop different job skills in their students, because a strong connection between education and the job market is in demand. Policymakers need to incorporate all these requirements into their strategic planning and education models to prepare students for the new work environment. Furthermore, for future research, an integrative framework is required to analyze a comprehensive

picture of different factors related to students' e-learning and employability skills.

Conclusion

This study identified the major areas, countries, authors, and publishers associated with research in e-learning and employability. Review observed trends in methodological approaches and the entities studied. The review facilitated the identification of key focus areas and outcomes of e-learning and employability research. In the selected articles, the major research focus was on analyzing the impact of e-learning's supported model, usefulness of online tools and technologies in flipped classrooms, and use of technology in the form of e-portfolio and e-learning environment to support lifelong learning for increasing employability skills of students as well as WIL placement. The present study identified that scholarly interest and publications on e-learning and employability research have significantly increased since 2018, with increased focus on functionalities and effectiveness of advanced digital tools and methods in enhancing knowledge, skills, and competencies in higher education. For example, the use of OCAs, effectiveness of MOOC, Mobile X-Space, flipped classrooms supported by digital environment, AR/VR etc. for improving students' job skills. The review identified that certain employability skills were more enhanced via e-learning: team skills, communication skills, critical thinking, management skills, information acquisition skills, research skills, and technology use skills. Out of 88 selected studies, 81 identified positive outcomes of e-learning in enhancing employability skills. This observation seems logical as the impact of e-learning on employability skills is of considerable interest to scholars and stakeholders of the education sector interested in issues related to higher education research. However, despite significant research over the past few years, numerous aspects of this topic remain unexplained. According to a study, "a review article can serve as a platform for future research." So, author encourage scholars to focus on other potential factors that might influence employability (10). This study reveals that little research in the sphere of higher education was teacher centric. Substantial attention is required on this aspect because teachers are significant stakeholders in higher education institutes. The socio-economically disadvantaged section of

society has also been ignored; more research is required on how to enhance their skills via affordable digital technologies. Additionally, future researchers can include factors related to macro-level variables, such as globalization, labor markets and job regulations and policies. Future studies should evaluate whether e-learning can address the needs of diverse sections of society, such as vulnerable and disabled populations.

Abbreviations

CBT: Competency-based training
 E-Portfolio: Electronic Portfolio
 HWC: Home-to-work conflict
 HWF: Home-to-work facilitation
 LMS: Learning Management System
 MOOC: Massive Open Online Course
 OCAs: Online collaborative assignments
 SNSs: Social network sites
 STS: Social-technical system
 VR/AR: Virtual Reality and Augmented Reality
 WIL: Work integrated learning
 WILCAO: Work-Integrated Learning with Content and Assessment Online

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