ROLE OF TECHNOLOGY IN FACILITATING ADULT EDUCATION PROGRAMME: A STUDY OF ONLINE LEARNING PLATFORMS

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Abstract

The study aimed at examining the impact of online learning platforms on the delivery of adult education programme and explores ways in which educators can optimize these platforms to better serve the needs of adult learners. Three research questions and three objectives were formulated to guide the study. The study adopted a descriptive survey research design. The population of the study comprised the 105 adult educators randomly selected from the University of Nigeria, Nsukka, Enugu State, Nigeria. As the population size was manageable, there was no need for sampling, which allowed the researchers to obtain comprehensive data without any significant challenges or errors. The instrument for data collection was a structured questionnaire developed by the researchers titled: "Technology for Adult Education Programme Questionnaire (TAEPQ)". The instrument was face validated by three experts, two from the Department of Adult Education and Extra-Mural Studies, and one from the Department of Science Education, all from the Faculty of Education, University of Nigeria, Nsukka. Cranach Alpha was used to determine the reliability of the instrument which yielded a high reliability coefficient value of 0.82. Data were analyzed using mean and standard deviation. The findings of the study suggest that online learning platforms have the potential to expand access to education and increase learner engagement, but that effective implementation requires careful consideration of learner needs, instructional design, and technical support. The finding of this study also revealed that educators can optimize online learning platforms by incorporating interactive and collaborative learning activities, providing personalized feedback and support, and creating a learner-centered approach that focuses on the individual needs and goals of adult learners. Based on the findings, it was recommended among others that adult educators and policymakers can improve the quality of online learning and ensure that learners have a positive and productive learning experience.

Keywords: Technology, adult education, online learning platforms, adult learners

Introduction

Online learning platforms have become increasingly popular in recent years, offering adult learners a flexible and accessible way to acquire new knowledge and skills at the same time as the use of technology in education has become increasingly important in recent years, as it offers new opportunities for learning and skill development. According to Hodges, Moore, Lockee, Trust and Bond (2020), the COVID-19 pandemic has accelerated the shift towards online learning, as schools and universities have had to adapt to remote learning environments. Online learning platforms have emerged as a popular tool for delivering education and training to adults, providing flexible and accessible options for learning. As pointed out by Garrison and Kanuka (2004), the integration of technology into adult education has the potential to enhance learning experiences, engage learners, enhance adult learners' learning experiences, engage learners for lifelong learning, provide learners with greater convenience, provide learners with individualized feedback and provide opportunities for lifelong learning. Furthermore, the integration of technology in adult education has become increasingly prevalent over the past few decades. The emergence of the internet and digital devices has made it possible for adult learners to access a broad range of technology-

based tools and resources to support their learning. According to Kumar and Vigil (2018), technology has revolutionized adult education by providing learners with greater flexibility and convenience, as online learning platforms and digital resources enable learners to access learning materials at any time and from anywhere. Furthermore, technology can also enhance the learning experience by making it more interactive and engaging. Studies conducted by Conrad and Donaldson (2012) and Beaudoin (2010) also posited that the current trends in the online learning platforms for adult education include personalization, flexibility, interactive learning, collaborative learning, micro-credentials and certifications, mobile learning, social learning, and artificial intelligence and machine learning (Gallagher, 2019).

Online learning platforms are increasingly using data analytics and artificial intelligence to personalize learning experiences. This allows platforms to understand the learner's preferences, goals, and learning style, and then provide content and resources that are tailored to their individual needs. Flexibility: Online learning platforms offer the flexibility to learn at one's own pace, time and location. This is especially beneficial for working adults who may not have the time to attend traditional classes (Huett, Howell & Sorensen, 2008). Interactive learning: Online learning platforms are incorporating more interactive learning tools like gamification, simulations, and virtual reality, making learning more engaging and effective (Wills &Stolarick, 2018).

Collaborative learning: Online learning platforms are also emphasizing collaborative learning opportunities, where learners can work together on projects, discuss course material, and provide peer feedback. Micro-credentials and certifications: Online learning platforms are increasingly offering micro-credentials and certifications that validate learners' skills and knowledge, which can help them advance their careers. Mobile learning: With the increasing use of mobile devices, online learning platforms are offering mobile-responsive designs, allowing learners to access course material on their smartphones or tablets (Samaka, 2013). Social learning: Online learning platforms are integrating social media and other social learning tools to facilitate peer-to-peer interaction, networking, and collaboration (Friesen & Lee, 2018). Artificial intelligence and machine learning: Online learning platforms are incorporating AI and machine learning to automate administrative tasks, provide personalized feedback, and improve the effectiveness of the learning experience (Luckin, 2018).By and large, these features and trends show that online learning platforms for adult education are becoming more sophisticated and effective in meeting the needs of learners in a rapidly changing world.

Multimedia resources such as videos, podcasts, and interactive simulations can help to reinforce key concepts and maintain learners' engagement with the material. As noted by Sharpe, Benfield, Roberts and Francis (2019), technology has the potential to create an immersive learning environment that promotes active learning and enhances knowledge retention. Interestingly, personalization is another advantage of technology in adult education. Digital tools and platforms can provide learners with individualized feedback and recommendations based on their learning styles and progress, which can improve learning outcomes. According to Paredes, de-Marcos and García-López (2021), technology can support personalized learning by creating opportunities for learners to engage with content in their preferred format and at their own pace.

Despite the benefits, the use of technology in adult education also presents challenges and limitations. Equity and access issues can arise if learners lack access to digital devices or reliable internet connections. Privacy and security concerns may arise as learners' personal data may be at risk if appropriate safeguards are not in place. Technical support and training are also necessary to ensure that educators and learners are equipped with the skills and knowledge to use technology effectively. However, the role of technology in adult education is likely to continue to expand in the future. As new technologies and tools emerge, educators

and policymakers have to collaborate to ensure that they are used responsibly and effectively to support the learning needs of adult learners.

The integration of technology into adult education has been a topic of interest for many years, and a significant amount of research has been conducted in this area. According to Garrison and Kanuka (2004), online learning platforms offer a variety of benefits to adult learners, including increased accessibility, flexibility, and convenience. The authors further put forward that online learning platforms have the potential to engage learners in a more active and participatory way, providing opportunities for collaboration and interaction with peers and instructors (Garrison &Kanuka, 2004). As study conducted by Hodges et al. (2020) also noted that online learning has become increasingly popular, with the COVID-19 pandemic accelerating its adoption. The authors highlighted the importance of designing and delivering high-quality online courses that are engaging, interactive, and cater to the needs of diverse learners (Hodges et al, 2020). The authors also emphasized the need for adequate support and resources for learners, as well as professional development opportunities for instructors.

Research conducted by Carr, Morrison, and Cox (2019) has also shown that online learning platforms can have a positive impact on the retention and completion rates of adult learners. A study by Carr, Morrison, and Cox found that adult learners who participated in online courses had higher completion rates compared to those who participated in traditional face-to-face courses. The study also found that online learners reported higher levels of satisfaction with their courses, as well as increased confidence in their ability to apply what they had learned. However, online learning platforms are not without limitations. A study by Means, Toyama, Murphy and Baki (2013) found that the effectiveness of online learning depends on a variety of factors, including the quality of course design, instructor support, and learner motivation. The authors also found that online learning may not be suitable for all learners, as some may require more structure and face-to-face interaction. The authors also posited that online learning platforms have the potential to enhance adult education by providing flexible and accessible learning opportunities. However, their success depends on the quality of course design and delivery, as well as the support provided to learners (Means, Toyama, Murphy & Baki, 2013). The authors of this paper hope to contribute to the ongoing discussions on the role of technology in facilitating adult education by examining the impact of online learning platforms and sharing best practices for their design and implementation.

Importantly, the online learning platforms for adult education are constantly evolving, as new technologies and approaches are developed and adopted. According to a recent report by the eLearning Industry (2021), the market for online learning platforms is growing rapidly, driven by increased demand for flexible and accessible learning options. The report notes that advancements in artificial intelligence, machine learning, and virtual reality are changing the way that online courses are designed and delivered, offering new opportunities for personalized and immersive learning experiences. In terms of best practices for online course design and delivery, the state of the art emphasizes the importance of learner-centered approaches that cater for the diverse needs of adult learners. According to the Online Learning Consortium (2021), effective online course sought to be designed with clear learning objectives, multiple modes of engagement, and opportunities for reflection and feedback. The Online Learning Consortium further emphasized on the importance of providing adequate support and resources for learners, including technical support, academic advising, and career counseling.

However, designing an effective online course requires consideration of the diverse needs and preferences of adult learners. Adult learners have unique characteristics and requirements, such as prior knowledge, different learning styles, work and family responsibilities, and varying levels of computer literacy. Meeting the needs of these learners

requires a learner-centered approach, the use of multiple modes of instruction, incorporating real-life examples and scenarios, offering opportunities for collaboration and interaction, making the course accessible to all learners, and providing feedback and support. By incorporating these best practices, instructors can create online courses that meet the diverse needs of adult learners, enhance their learning experience, and help them achieve their learning goals. To create an effective course, it is important to consider the unique needs and preferences of adult learners. According to Brusilovsky, Somyürek, and Guerra (2014), creating a learner-centered course is critical to meeting the needs of adult learners. This can be done by incorporating activities and assessments that reflect their interests and skills.

Additionally, offering multiple modes of instruction can help cater for the different learning styles of adult learners (Palloff & Pratt, 2013). These modes can include video lectures, audio podcasts, written materials, and interactive activities. To make the course content more relevant to adult learners, it is important to incorporate real-life examples and scenarios. This helps learners understand how the course material applies to their personal and professional lives. Providing opportunities for collaboration and interaction is also important for adult learners (Brookfield, 2013). Discussion forums, group projects, and peer-to-peer feedback can enhance the learning experience and help learners build a sense of community. Making the course accessible to all learners is another critical consideration. According to Burgstahler (2015), ensuring that the course content and assessments are accessible to learners with disabilities is important. This includes designing the course for all types of devices, including smartphones and tablets. Finally, providing feedback and support is essential for adult learners (Garrison & Cleveland-Innes, 2005). Regular feedback on assessments and assignments, as well as additional resources and support, can help learners stay motivated and engaged throughout the course.

However, by incorporating these best practices, online courses can be designed to meet the diverse needs of adult learners and help them achieve their learning goals. On the whole, the state of the ability in online learning platforms for adult education emphasizes the need for learner-centered approaches that are designed to meet the diverse needs of adult learners. It also emphasizes the importance of providing adequate support and resources for learners, as well as professional development opportunities for instructors. As technology continues to advance and the demand for online learning grows, it is likely that the state of the art will continue to evolve and adapt to meet the changing needs of learners and educators.

Statement of the Problem

Online learning platforms for adult education have become increasingly popular in recent years, offering flexible and accessible options for learners with busy schedules or geographical limitations. However, despite the benefits of online learning, there are several challenges and limitations associated with this mode of education. One of the main challenges is ensuring that online courses are designed and delivered in a way that meets the diverse needs of adult learners. Adult learners have different backgrounds, experiences, and learning styles, which can make it difficult to design courses that effectively cater for their needs. Additionally, online courses can be isolating and lack the social interaction and support that traditional face-to-face courses offer, which can lead to low engagement and motivation among learners. Another challenge is ensuring that online instructors are adequately trained and equipped with the necessary skills and competencies to teach effectively in an online environment. Many instructors are trained in traditional face-to-face teaching methods and may not have the expertise or experience to effectively design and deliver online courses. Largely, the problem addressed in this research paper is the need to identify best practices for designing and delivering online courses that cater for the diverse

needs of adult learners and to improve instructor development and training to better support online teaching in adult education. Hence, addressing these challenges ensures that technology effectively facilitates adult education programs through online learning platforms, providing accessible and valuable options for adults seeking further education and professional development.

Purpose of the Study

This general purpose of the study is to examine the impact of online learning platforms on adult education, exploring the advantages and limitations of these platforms and best practices for designing and implementing them. Specifically, the study sought to:

1. examine the current trends in the online learning platforms for adult education.
2. ascertain the best practices for online course delivery to enhance diverse needs of adult learners.
3. determine the potentials of online learning platforms to improve teaching for adult learners

Research Questions

The following research questions guided the study:

1. What are the current trends in online learning platforms for adult education?
2. What are the best practices for online course delivery to enhance diverse needs of adult learners?
3. What are the potentials of online learning platforms to improve teaching for adult learners?

Methods

The study adopted a descriptive survey research design. The population of the study comprised the 105 adult educators randomly selected from the University of Nigerian, Nsukka, Enugu State, Nigeria. Since the population size was small enough to be easily manageable and accessible, it was not necessary to take a sample of the population. The entire population could be included in the study without any significant challenges or logistical issues, which provided a comprehensive understanding of the population characteristics and reduced the potential for sampling errors. Therefore, the researchers were able to analyze and interpret data with a higher degree of accuracy and precision. The instrument for data collection was structured questionnaire developed by the researchers titled: "Technology for Adult Education Programme Questionnaire (TAEPQ)". The instrument was face validated by three experts, two from the Department of Adult Education and Extra-Mural Studies, and one from the Department of Science Education, all from the Faculty of Education, University of Nigeria, Nsukka. The suggestions and inputs of the experts were reflected on the final draft of the instrument. The Cronbach Alpha was used to determine the reliability of the instrument which yielded a high reliability coefficient value of 0.82. Data were analyzed using mean and standard deviation. The mean responses were adjudged on the basis that any mean score of 2.50 or above is considered accepted while any mean score that falls below 2.50 is considered unacceptable.

Results

Research Question One: What are the current trends in online learning platforms for adult education?

Table 1: Mean and Standard Deviation of Responses on the potential of online learning platforms to improve teaching for adult learners

S/N	Item Statement	Mean	Standard Deviation	Decision
1	Personalization learning	2.66	0.17	A
2	Flexibility learning	2.78	0.15	A
3	Interactive learning	2.98	0.10	A
4	Collaborative learning	2.71	0.16	A
5	Micro-credentials and certifications learning	2.64	0.17	A
6	Mobile learning	2.54	0.18	A
7	Social learning	2.50	0.19	A
8	Artificial intelligence and machine learning	2.51	0.19	A
	Cluster Mean	**2.67**	**0.16**	**A**

Result in Table 1 shows the mean ratings and standard deviation of responses on the current trends in online learning platforms for adult education. The item met the standard mean score of 2.50 and above which indicate acceptance by respondents. The mentioned items were seen as the potentials of online learning platforms to improve teaching for adult learners based on the cluster mean score of 2.67 and a standard deviation of 0.16 correspondingly. The following are the current trends in online learning platforms for adult education: personalization learning; flexibility learning; interactive learning; mobile learning, among others.

Research Question Two: What are the best practices for online course delivery to enhance diverse needs of adult learners?

Table 2: Mean and Standard Deviation of Responses on the best practices for online course delivery to enhance diverse needs of adult learners

S/N	Item Statement	Mean	Standard Deviation	Decision
9	Create a learner-centered course	2.99	0.10	A
10	Offer multiple modes of instruction	2.77	0.15	A
11	Incorporate real-life examples and scenarios	2.55	0.18	A
12	Provide opportunities for collaboration and interaction	2.66	0.17	A
13	Provide feedback and support	2.61	0.17	A
14	Provide opportunities for interaction	2.81	0.14	A
	Cluster Mean	**2.73**	**0.15**	**A**

Data presented in table 2 revealed that mean rating of respondents are greater that 2.50 for each of the 14 questionnaire items. This implies that respondents agreed that the mentioned items arethe best practices for online course delivery to enhance diverse needs of adult learners with the cluster mean score of 2.73 and standard deviation of 0.15. The standard deviation scores for all the items in the cluster are within the same range, indicating that the respondents are standardized in their responses. The following were accepted as the best practices for online course delivery: create a learner-centered course; offer multiple modes of instruction; incorporate real-life examples and scenarios; provide opportunities for collaboration and interaction; provide feedback and support and provide opportunities for interaction

Research Question Three: What are the potentials of online learning platforms to improve teaching for adult learners?

Table 3: Mean and Standard Deviation of Responses on the potential of online learning platforms to improve teaching for adult learners

S/N	Item Statement	Mean	Standard Deviation	Decision
15	Enhance adult learners learning experiences.	3.01	0.09	A
16	Engage learners for lifelong learning.	3.12	0.05	A
17	Provide learners the opportunities for lifelong learning.	3.00	0.10	A
18	Provide learners with greater flexibility	3.11	0.06	A
19	Provide learners with greater convenience	3.10	0.06	A
20	Enable learners to access learning materials at any time or any anywhere.	2.51	0.19	A
21	Enhance learners learning experience by making it more interactive and engaging.	2.92	0.12	A
22	Provide learners with individualized feedback	2.97	0.11	A
23	Enhance learners learning styles which improve learning outcomes.	2.54	0.18	A
24	Support personalized learning by creating opportunities for learners to engage with content in their preferred	2.83	0.14	A
	Cluster Mean	**2.91**	**0.11**	**A**

Table 3 shows the mean ratings and standard deviation score on the potentials of online learning platforms to improve teaching for adult learners. Item 15 – 24 met above the standard mean ratings of 2.50. The rated statements were accepted based on the cluster mean score of 2.91 and standard deviation of 0.11 respectively. The following were accepted as the potentials of online learning platforms to improve teaching for adult learners: enhance adult learners learning experiences; engage learners for lifelong learning; provide learners the opportunities for lifelong learning; provide learners with greater flexibility; provide learners with greater convenience; provide learners with individualized feedback, among others.

Discussion

The findings of this study have significant implications for online learning platforms in adult education, as highlighted by authors such as Conrad and Donaldson (2012). Firstly, the study is in agreement with the findings of Conrad and Donaldson (2012) and Beaudoin (2010) who identified several key features and trends in online learning platforms for adult education, such as the importance of interactivity, personalization, micro-credentials and certifications, mobile learning, social learning, artificial intelligence, collaboration learning, and flexibility learning in course design. These features are crucial for ensuring that online courses effectively cater to the diverse needs of adult learners, increasing engagement, motivation, and overall learning outcomes. As Conrad and Donaldson (2012) note, online courses need to be designed with the unique characteristics and needs of adult learners in mind, to ensure that they are effective and relevant.

The findings of the study revealed the potential of online learning platforms to improve teaching for adult learners and the importance training approach to improve online course delivery to enhance diverse needs of adult learners. Online instructors require

specialized training and support to effectively design and deliver online courses, as well as to provide adequate support and feedback to learners. The findings of the study in agreement with the findings of Burgstahler (2015), who posited that this can be achieved through the provision of professional development opportunities and training programmes that specifically target online teaching in adult education such as creating a learner-centered course, offering multiple modes of instruction, incorporating real-life examples and scenarios, providing opportunities for collaboration and interaction, making the course accessible and providing feedback and support.

Moreover, the study has demonstrated the potential of online learning platforms to overcome some of the limitations associated with traditional face-to-face courses, such as geographical limitations and time constraints. Online learning platforms can provide flexible and accessible options for adult learners, allowing them to fit education around their work and personal commitments. The findings of the study is in consonance with the finding of Garrison and Kanuka (2004) who note that online learning platforms can provide a range of benefits, including greater flexibility, increased accessibility, learning experiences, opportunities for lifelong learning, greater convenience, individualized feedback and the potential for increased interaction and engagement among learners. However, there are also limitations to online learning platforms that must be addressed, as highlighted by authors such as Palloff and Pratt (2010). Online courses can be isolating and lack the social interaction and support that traditional face-to-face courses offer. To address this, online learning platforms can incorporate social learning opportunities, such as group projects, peer review, and discussion forums, to increase interaction and engagement among learners. Hence, this study has highlighted the potential of online learning platforms in adult education, as well as the challenges and limitations that must be addressed. Hence, by identifying best practices for online course design and delivery, as well as improving instructor development and training, online learning platforms can become more effective and accessible options for adult learners seeking to further their education and professional development (Conrad & Donaldson, 2012).

Conclusion

In conclusion, this study has highlighted the importance of online learning in adult education. The findings suggest that online learning can be an effective and flexible method for delivering education to adult learners. The study also identified several challenges and barriers to online learning, including technical issues, lack of interaction, and limited access to resources. Despite these challenges, the potential of online learning in adult education cannot be ignored. Online learning has the potential to reach a wider audience of adult learners and provide them with the skills and knowledge needed to succeed in their careers and personal lives. As the world becomes increasingly digital, it is likely that online learning will continue to play an important role in adult education. Educators and policymakers should work together to address the challenges associated with online learning and ensure that learners have access to high-quality and engaging online education. In the future, it will be important to continue to explore new technologies and approaches to online learning that can enhance the learning experience for adult learners. This may include the use of virtual and augmented reality, artificial intelligence, and other emerging technologies.

Recommendations

Based on the findings of this study, the following recommendations were made:
1. It is important for educators to receive adequate training on online teaching and learning methods. This can be achieved through workshops, seminars, and online

training courses. Policymakers should provide the necessary funding to support these initiatives.
2. Educators should encourage collaboration among learners and provide opportunities for them to work in groups. Policymakers can support this by providing platforms and tools for collaborative learning.
3. . Educators should consider using blended learning approach in their courses. Policymakers can support this by providing the necessary infrastructure and resources for blended learning.
4. Learners may require additional support services when learning online. Educators should provide support services such as online tutoring, counseling, and technical support. Policymakers should provide funding to support these services.
5. Online learning should be accessible to all learners, regardless of their location or abilities. Educators should ensure that their courses are designed with accessibility in mind. Policymakers can support this by providing guidelines and regulations for accessibility in online learning.

References

Beaudoin, M. (2010). *The e-learner survival guide*. Pearson Education.

Brookfield, S. D. (2013). *Powerful techniques for teaching adults*. John Wiley & Sons press.

Brusilovsky, P., Somyürek, S., & Guerra, J. (2014). User models for personalized learning. In The Handbook of Learning Analytics (pp. 213-220). Society for Learning Analytics Research.

Burgstahler, S. (2015). Equal access: Universal design of instruction. In The Cambridge Handbook of the Learning Sciences (pp. 290-304). Cambridge University Press.

Carr, T., Morrison, A., Cox, G., & Deacon, A. (2007). Weathering wikis: Net-based learning meets political science in a South African university. *Computers and Composition, 24*(3), 266-284

Conrad, R. M., & Donaldson, J. A. (2012). Engaging the online learner: Activities and resources for creative instruction. John Wiley & Sons.

eLearning Industry (2021). Impact of the e-Larning industry on our lives. Retrieved from: https://elearningindustry.com/impact-of-the-elearning-industry-on-our-lives

Friesen, J. S., & Lee, C. M. (2018). Social learning: The use of social media in online learning: A metasynthesis. *Educational Technology & Society, 21*(2), 237-252.

Gallagher, S. (2019). Micro-credentials and certifications: Microcredentials and digital badges: New credentials for the new learning landscape. Educause Review.

Garrison, D. R., & Cleveland-Innes, M. (2005). Facilitating cognitive presence in online learning: Interaction is not enough. *American Journal of Distance Education, 19*(3), 133-148.

Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *The Internet and Higher Education, 7(*2), 95-105.

Hodges, C., Moore, S., Lockee, B., Trust, T, & Bond, A. (2020). The difference between emergency remote teaching and online learning. Educause Review. Retrieved from: https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching

Huett, J. B., Howell, M. D., & Sorensen, K. M. (2008). Flexibility: online learning and the adult learner. *Journal of Adult Education, 37*(2), 1-12.

Kumar, A., & Vigil, K. (2018). The impact of technology on adult learning. *International Journal of Information and Education Technology, 8(*7), 508-512.

Luckin, R. (2018). Artificial intelligence and machine learning: Artificial intelligence in education. *Nature Human Behaviour, 2*(1), 16-23.

Means, B., Toyama, Y., Murphy, R. & Baki, M. (2013). The effectiveness of online and blended learning: a meta-analysis of the empirical literature. *Teachers College Record 115*, 1–47.

Online Learning Consortium (2021). Learning anytime, anyway. Retrieved from: https://onlinelearningconsortium.org/

Palloff, R. M., & Pratt, K. (2010). Collaborating online: Learning together in community. John Wiley & Sons.

Palloff, R. M., & Pratt, K. (2013). Lessons from the virtual classroom: The realities of online teaching. John Wiley & Sons.

Paredes, P., de-Marcos, L., & García-López, E. (2021). Personalized learning in higher education: A systematic review of empirical research. *Computers & Education*, 162, 104042.

Samaka, M. (2013). Mobile learning: "mobile learning: Definition, advantages, and challenges". *International Journal of Education and Development using Information and Communication Technology*, 9(3), 4-18.

Sharpe, R., Benfield, G., Roberts, G., & Francis, R. (2019). The undergraduate experience of blended synchronous learning: A review of practice and research. York: Higher Education Academy.

Wills, S., & Stolarick, K. (2018). Interactive learning: "The use of gamification in learning and assessment". *Journal of Educational Technology and Society, 21(*2), 9-20.