

Literature Review on Online Education Methods and Best Practices

Seminar paper

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Abstract

Online education methods have become even more relevant due to digitalization and the Covid-19 pandemic. Different educational institutions have used different methods. This paper consolidates the state of the research on online education methods based on a systematic review. Concepts for the classification of the different methods were created.

Keywords: "Online education methods", "Digital education methods", "Online education Best practices"

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1 Introduction

The influence of trends and external developments over the past years had a significant impact on education worldwide. The crucial influence of a global pandemic or the increase in globalization and digitalization resulted in home-office, homeschooling, and a widespread on online education methods (Jain *et al.*, 2021). The pandemic forced the development of traditional education towards distance learning, blended learning, or online learning (Dwivedi *et al.*, 2019). To introduce those new learning methods with the advantages of digitization, it is important to focus on the right education methods. The mentioned factors and trends have ensured that a variety of methods have been tried and tested and others developed and improved (Hong *et al.*, 2020). The different online education methods bring different advantages and disadvantages, which are discussed below. This includes the implementation of best practices methods as well.

In this literature review, best practices methods are defined as referring to a proven approach, practice, or method for performing a repetitive activity or undertaking in the most optional manner. It is a type of pattern that is used to produce a defined result (Finch and Jacobs, 2012).

This literature review delivers contributions to an academic and professional context in choosing the right online education methods for students or employees. Also, the review should give an overview of the differences between the education methods and the use of the different advantages and disadvantages. The force of switching from traditional face-to-face learning to online education methods due to the Covid-19 pandemic also showed a variety of advantages in terms of flexibility, motivation, and self-employment (Masalimova *et al.*, 2022).

Despite a large number of findings on this topic, there is a lack of understanding on what kind of studies have been conducted under the term online education methods, with which methods, what kinds of results they yield, and under which circumstances. Also, a relevant question about online education methods is about the effectiveness and the best practical approach (Hong *et al.*, 2020). There are many online education methods and more providers for each method, also with different advantages and disadvantages. Due to the importance and relevance of online education in terms of the current developments, the methods to their effectiveness are a topic as well. Therefore, many studies execute qualitative and quantitative studies on the effectiveness (Werang and Radja Leba, 2022). This literature review contributes to the understanding of online education methods by reviewing the existing body of empirical research on the topic. What is the state of the art of academic literature on online education methods, and what are the relevant dimensions determining?

We proceed as follows. First, we describe the methodological approach for the rigorous literature review. Second, we present the findings including the dimensions and concepts identified. In the end, we discuss our findings, relate them to other research streams, and develop a future research agenda before we conclude.

2 Literature Review

2.1 Define and search

The process of identifying the relevant literature was based on the grounded theory by (Wolfswinkel, Furtmueller and Wilderom, 2013) and separated into five stages. At first, I defined inclusion and exclusion criteria by using sources to focus on the crucial literature. Therefore, I have established six criteria, starting with the consistency of the scope and purpose of the literature review, and just using primary research. The next criteria were to use only sources and papers with a least a good reputation for being peer-reviewed to ensure the quality of the findings. After I excluded all the outdated literature. The last exclusion criteria for defining the relevant literature were to not use Journals which a certain commercial context and no certain industry or country focus.

After that, I choose the databases for the research and determine AISEL, Sciencedirekt, EBSCO, and GoogleScholar. To identify the relevant Keywords for this literature review I was looking for terms that

cover the entire scope of the review. This led to keywords to the keywords “Online Education Methods”, “Online Education Best Practices” and “Digital Education Methods”. By not using the quotation marks the results in each database were at least 100.000 findings and the scope were way too far away from the goal of this literature review as referred to in (Wolfswinkel, Furtmueller and Wilderom, 2013). To keep the scope itself more focused I also searched the keywords in the title, abstract, and references as shown in the following tables.

Database	Filter	Results	Peer-Reviewed	Duplicates
AISel	Titel, Abstract, References	25	6	<u>1</u>
ScienceDirect	Titel, Abstract, References	16	16	<u>3</u>
EBSCO	Titel, Abstract, References	108	9	<u>3</u>
GoogleScholar	No Filter	359	0	<u>8</u>
<u>Total</u>		<u>508</u>	<u>31</u>	<u>15</u>

Table 1. Findings for the Keyword "Online Education Methods".

Keyword: “Online Education Best Practices”

Database	Filter	Results	Peer-Reviewed	Duplicates
AISel	Titel, Abstract, References	20	4	<u>0</u>
ScienceDirect	Titel, Abstract, References	1	1	<u>0</u>
EBSCO	Titel, Abstract, References	33	2	<u>2</u>
GoogleScholar	Titel, Abstract, References	102	0	<u>2</u>
<u>Total</u>		<u>156</u>	<u>7</u>	<u>4</u>

Table 2. Findings for the Keyword "Online Education Best Practices".

Keyword: “Digital Education Methods”

Database	Filter	Results	Peer-Reviewed	Duplicates
AISel	Titel, Abstract, References	0	0	<u>0</u>
ScienceDirect	Titel, Abstract, References	5	5	<u>2</u>
EBSCO	Titel, Abstract, References	31	6	<u>3</u>
GoogleScholar	Titel, Abstract, References	83	0	<u>3</u>
<u>Total</u>		<u>119</u>	<u>11</u>	<u>8</u>

Table 3. Findings for the Keyword "Digital Education Methods".

After preparing the search itself, the next step was to screen all the determined databases. In this process, I included all the relevant literature including duplicates to make the research as transparent as possible. Also, I documented literature to which I had no access.

2.2 Select, analyze, and present

Step three after (Wolfswinkel, Furtmueller and Wilderom, 2013) is to reduce the selection of the literature. At first, I excluded all duplicates of the research and those sources where the content was not in the scope of the literature review. This step reduces the sources to just 20 relevant papers. After that, I used the citations in the remaining literature to conduct forward and backward research. With this step, I wanted to make the scope of relevant literature complete.

In this process, I read all the identified literature and point out the relevant concepts, findings, and insights that are mentioned in the paper. This information including the previous steps has been put together in a research table for the literature review. By reading the articles and with the use of the research

table the first step to analyzing the literature was to create a concept matrix after (Webster and Watson, 2002). In this step, I used the mentioned content in the research table to formulate the concepts. I focused on four concepts to summarize the online education methods and best practices in asynchronous and visual methods, asynchronous and non-visual methods, synchronous and visual methods, and synchronous and non-visual methods and added the number of authors who mentioned the concepts.

Authors	Asynchronous	Synchronous	visual	non-visual
Heidi S. Harris, Elwyn W. Martin	x	x	x	x
Fatemeh Jafarzadeh-Kenarsari et al.	x	x	x	
Hongxin Zhang, Jin Zhang, Xue Yin, Kann Zhou, Zhigeng Pan	x	x	x	x
Balachandran Vadivel, M. Mathuranjali, Nawroz Ramadan Khalil	x		x	x
Vahide Cana	x	x		
Shipra Jain, Ruchika Kalra, Prerna Goswami, Pushkar Mani	x	x	x	
Alfiya R. Masalimova, Maria A. Khvatova, Lyudmila S. Chikileva, Elena P. Zvyagintseva, Valentina V. Stepanova, Mariya V. Melnik	x	x		
Cristina Pires Camargo, Patricia Zen Temp-ski, Fabio Freitas Busnardo, Milton de Arruda Martins, Rolf Gemperli		x	x	
Misook Heo, Anthony Chow	x			x
Geetha Poornima K., Vinayachandra, Rajeshwari M, Krishna Parsad K.	x	x	x	x
Larysa Oleksiienko, Liubov Sheptytska, Olena Fonariuk		x	x	
Yun Hong, Xiaolan Li, Yingwen Lin, Jun Xie, Xutong Yan, Zhengmei Lin	x	x		
Basilus R. Werang, Seli Marlina Radja Leba		x	x	x
Pitambar Paudel	x	x	x	
Dr Ece Dogántan		x	x	
Madhu Arora, Lalit Mohan Goyal, Nalini Chintalapudi, Mamta Mittal	x	x	x	x
Abduvakhidov, Abdumalik Maxkamovich; Mannapova, Elzara Toraxanovna; Akhmets-hin, Elvir Munirovich	x			x
Aleksandr Surin, Marietta Surina, O.S. Goltseva, S.G. Sunaeva, and I.I. Gerasimenko	x	x		x
AneelaMaqsood, JaffarAbbas, GhazalaRehman, RiaqaMubeen	x	x	x	x
Yuyun Yulia, Febriana Eko Prasetyawati			x	
William Villegas-Ch, Milton Román-Cañizares, Xavier Palacios-Pacheco	x	x		x
Vishwesh Nagamalla, Dr. J K R Sastry		x	x	x
Anthony G. Picciano	x	x		
Alka Dwivedi, Prasoom Dwivedi, Samo Bobek, Simona Sternad Zabukovšek		x	x	
Denise Finch, Karen Jacobs		x	x	x

Table 4. Concept Matrix.

3 Findings

3.1 State of the Art

Matrix	Visual	Non-Visual
Synchronous Methods	Screen-sharing/ Online Whiteboard, Application sharing, Audio and video conferences, Webcasting, Online interactive presentations, AR	Chat, Instant Messaging, Polling
Asynchronous Methods	Narrated Presentation with Voiceover, Online Collaboration Tools, flipped classroom, virtual labs, virtual classroom, online video channels	E-Mail, Discussion Forums, Wikis, Blogs, Podcast, E-portfolio, Personal websites, Online forms

Table 5. Online Education Methods Matrix.

A total of 25 sources were reviewed and analyzed to present the current state of Online Education Methods. Within the framework of the methodology, provisions were already made for the consistency of the sources, whereby all sources were used to focus on the topic of online education methods and best practices. In the introduction, a definition of terms and a definition of the topic were made. In the following, the studies will be referred to and evaluated according to the concept matrix in synchronous and non-visual education methods, synchronous and visual methods, asynchronous and non-visual education methods, and asynchronous and visual education methods. For this purpose, the four concepts of the found literature are listed once and explained in the following:

In the beginning, the current state of Online Education Methods is presented, and the common methods are explained. Furthermore, the satisfaction of the students regarding their motivation will be investigated. The effectiveness of the different online education methods will also be examined.

For a precise analysis of the findings, the methods must be differentiated into synchronous and asynchronous methods. The focus here is on whether the teaching takes place in real-time or not (Doğantan, 2020). If this is not the case, the teaching is an asynchronous model and, conversely, real-time teaching is a synchronous model (Heo and Chow, 2005) (Doğantan, 2020). Blended learning, in turn, is characterized by the fact that a mixture of the two teaching methods is undertaken (Dwivedi *et al.*, 2019).

Teaching in synchronous models is characterized, among other things, by the fact that students and teachers participate in events at the same time or are at least available at the same time. This allows students to ask direct questions and clear up ambiguities immediately (Oleksienko, Sheptytska and Fonariuk, 2020). Asynchronous mode provides for students to work at their own pace, at their own times, and in a location of their own choosing (Dwivedi *et al.*, 2019). Students have the chance to work a little more independently and flexibly on their course material (Harris and Martin, 2012). Questions about lecture content can still be asked. This takes place in the asynchronous teaching mode via forums or chat groups (Werang and Radja Leba, 2022). Online teaching is realized using ICCT tools. Wikis, blogs, -emails, and even chats fall into the realm of social media and provide opportunities for participants to share information (Hong *et al.*, 2020). To maintain the option of face-to-face communication, tools such as Microsoft Teams, Cisco Webex, or even Zoom offer the possibility of face-to-face interactivity among students, but also between students and instructors (Hong *et al.*, 2020) (Paudel, 2020). One step above are tools such as Google Classroom or Moodle, which enable a kind of virtual classroom or lecture hall (Jafarzadeh-Kenarsari, Abouzari-Gazafroodi and Zaersabet, 2019). This is especially useful when the instructor finds that there are inhibitions due to, for example, the shyness of the students (Werang and Radja Leba, 2022). In addition, the asynchronous and synchronous methods were divided into visual and non-visual. Visual was defined by the fact that the student can see the teacher or not.

Gestures, facial expressions, or even the imitation of traditional teaching have a strong effect on the methods (Hong *et al.*, 2020).

3.2 Synchronous and non-visual Online Education Methods

Starting with the synchronous and non-visual methods, the familiar ones for most persons are chat, instant messaging, and rolling methods. These are all explained and defined individually in this chapter. Chats offer teachers and students the possibility of exchange and interactions during synchronous events (Masalimova *et al.*, 2022). When using different tools, such as Zoom, there is the possibility of creating breakout sessions or small individual chat rooms for group work or meetings. The chat process can be used very well for brainstorming (Vadivel, Mathuranjali and Khalil, 2021). This form of exchange is very well suited for strategic challenges or discussions, as the pro and con sides can appear as a group. The fact that the chat history is also saved or logged at the same time prevents misunderstandings in the discussions (Masalimova *et al.*, 2022).

Another method for online education is the use of instant messaging. It is one of the most popular web-based applications (Harris and Martin, 2012). This is a tool that offers the possibility of exchange for students and lecturers. This can happen in groups or between two people, similar to a chat function (Jain *et al.*, 2021). Instant messengers also offer the advantage of real-time communication. In this type of communication between students and instructors, among other things, files or links can be shared, so that one can get direct help or support with possible questions (Jain *et al.*, 2021).

However, teachers also have the option to conduct surveys and polls. In some cases, polls are a good way to accompany teaching. Possibilities for this are Internet sites such as Mentimeter. Students can dial into the site and answer a poll about a specific question using a numerical code (Harris and Martin, 2012). The results can then be shared by the administrator and used for teaching. Once the survey is completed, the result is directly available and can be interpreted if needed (Nagamalla, 2018).

3.3 Synchronous and visual Online Education Methods

Coming to synchronous and visual online education methods, we will first look at screen-sharing applications. If you want to support communication between students and teachers through visualization, you can use screen-sharing or online whiteboards (Harris and Martin, 2012). These allow the teacher to share the lecture material or to meet and interact in face-to-face communication (Arora *et al.*, 2020). Changes to the content or explanations through visualizations can be made very easily (Nagamalla, 2018). Instructors and teachers also have the opportunity to interact with students through the use of whiteboards and, for example, to brainstorm and work simultaneously on a document. Whiteboards also have the advantage that interactions between people can be used for collaborative learning (Lazareva, 2018). The learners can, among other things, make annotations or notes on the content. Applications for this are for example Miro, Zoom, Canvas Chrome application, or Groupboard. The possibilities in this area are very extensive (Lazareva, 2018).

In addition to screen-sharing methods, lectures can use Application sharing as well. Through this method, the teacher retains the ability to share his screen and share windows, applications, or even his screen with the students (Dwivedi *et al.*, 2019). This allows the students to see the shared content and control it with the authorization of the teacher. This teaching method is mainly used when several people want to learn, for example, the use and application of a particular software (Heo and Chow, 2005). However, this method can only be used for the presentation of content, otherwise, fluid usage would be lost. Applications that allow such use are Zoom, TeamViewer, Chrome Remote Desktop, or AnyDesk. Here are many different providers to find as well (Harris and Martin, 2012).

Audio and video conferences are another method for lecturers and students to interact visually. They take place in real-time and allow interaction between two or more participants (Oleksiienko, Sheptytska and Fonariuk, 2020). These are mainly used for meetings, but also frequently take place in Jour Fix. Meanwhile, many instant messaging applications also offer the option of conducting a video conference or an audio conference (Dwivedi *et al.*, 2019). Voice over Internet Protocol (VoIP) is often used for this

purpose. The advantage of this method is that students and teachers are offered an inexpensive but high-quality solution for exchanging information. Microsoft Teams, Zoom, and especially Skype are the most common applications in this area to conduct conversations over the Internet (Hong *et al.*, 2020). For a small fee, telephones can also be connected to these conferences. This improves the audio quality even more.

A difference between video conferences represents the webcast method. A webcast is an option in which the lecturer interacts with his students, but only the lecturer can take an active part (Nagamalla, 2018). The students are all in a passive role in which they cannot influence the lecturer (Lazareva, 2018). This form of synchronous method is often used for video lectures. Audio and video are available for passive users.

Like video conferences are interactive online presentations. This allows lecturers and students to participate in a virtual lecture, which has a direct impact on the motivation of the participants (Maqsood *et al.*, 2021). Various teaching events such as exams, lectures, oral exams, or even screencasts. They're utilized to do formative assessments, start conversations, and test knowledge with engaging quizzes (Maqsood *et al.*, 2021). This kind of education method is suitable for students of every age or class. The only condition is that they have access to the Internet and an appropriate device that enables the transmission. Through this method, the interaction of the participants can also take place through online lectures, with the addition that everyone can be heard. Providers for this are i-Spring Suite Max, Nearpod, Prezi, or Mentimeter (Harris and Martin, 2012).

A more innovative method in terms of online education is the use of augmented reality. Thanks to that students can effortlessly absorb, process, and retain information (Heo and Chow, 2005). In addition, AR makes learning more interesting and enjoyable. It is also not limited to a particular age group or level of education and can be used at all levels of education, from preschool to college (Villegas-Ch, Román-Cañizares and Palacios-Pacheco, 2020). Paper textbooks, physical models, posters, and written instructions can be replaced by augmented reality. It provides learning resources that are both portable and affordable. It makes education more accessible and mobile. AR learning, which is interactive and fun, can have a very positive impact on students (Picciano, 2015). It keeps students interested throughout the lesson and makes learning fun and easy. Teamwork skills are enhanced through interactive lessons where all students participate in the learning process simultaneously (Heo and Chow, 2005). AR in education helps students achieve better results by allowing them to see and fully engage with the subject matter. Accurate replication of real-world situations can help in mastering practical skills required for a particular job (Dwivedi *et al.*, 2019).

3.4 Asynchronous and non-visual Online Education Methods

Emails are an excellent way to communicate directly and independently between teachers and students. Through E-Mails students cannot just be asked general questions, they can ask specific questions as well. If the answer is optional and the topic is not critical, the question should be asked in a forum (Jain *et al.*, 2021). Emails can also be used for answers that may upset the recipient if posted in a public place. Newsletters can send a message to the community or notify all participants of a change or event. Only the teacher can send these messages, and not as frequently. Mailing lists can be used for conversations and sharing documents in small groups. They promote collaboration in project groups and joint work (Jain *et al.*, 2021).

Discussion forums are the main online debate tool (Kim *et al.*, 2021). They enable several participants to talk in the form of posted messages. In other words, at different times participants can communicate with others who can read and answer comments which remain on the forum (Surin *et al.*, 2021). One or more discussions may be included in each forum, consisting of one or more comments and responses. Forums are used for thematic discussions, collaborative case studies, posts-class comments, etc. Students and facilitators/teachers can leave messages, read, and answer. The discussion forums can be more appropriate for large groups compared to the mailing lists because participants can freely connect to the learning platform by having discussions jointly rather than by receiving numerous emails (Villegas-Ch,

Román-Cañizares and Palacios-Pacheco, 2020). Backchannel Chat, Kialo, or YO Teach are some of the examples.

Wikis offer the possibility to edit contributions of the most different kinds of online (Vadivel, Mathuranjali and Khalil, 2021). Here, every person has access to contributions. The difference from typical websites is that the contributions are mostly edited offline before they are uploaded again or for the first time. To edit contributions in wikis, users do not need any special access or technical equipment, as long as they are enabled by the administrator (Surin *et al.*, 2021). The administrator also has the option of limiting access, so that, for example, a task can be divided up and only edited by corresponding group members (Vadivel, Mathuranjali and Khalil, 2021).

Blogs provide an opportunity for users and students to share and disseminate information without the need for special IT skills or technical equipment (Paudel, 2020). Through them, students can have a kind of open conversation, on topics they have chosen themselves. The published material represents an analysis or a source of ideas that are frequently modified (Surin *et al.*, 2021). The central element of a blog is that it gives a voice to the blogger (as an individual or as a group) and a second voice to those who comment on the blog. Blogs allow information to be shared, accessed, and easily updated. They can be used especially well when students want to share ideas on a topic, such as a homework assignment, and discuss the results among themselves (Harris and Martin, 2012). Ideas can be collected, or discussions can be held.

The use of podcasts in education is also recommended and used as a method (Hong *et al.*, 2020). Here, audio files are made available to a group or an individual and can be listened to and downloaded by the students. This has the advantage of having flexible access to the content and stopping and pausing at any time. Here, presenters can switch to a topic so that multiple people contribute to a collection of audio files. Rubrics can be created on a given topic for students and faculty to interact (Dwivedi *et al.*, 2019). Providers for this option are Google Hangouts, Audacity, or Easypodcast.

The use of e-portfolios has also proven to be a useful tool. They have the advantage of being a collection of evidence that documents and chronicles learning progress. They can document a person's overall progress in a particular area or provide a general overview (Surin *et al.*, 2021). They have the advantage of supporting the learner organizationally and serve for reflection.

Online forms are a suitable method for teachers to create and conduct surveys, forms, or assessments. These can be used for assessment, as well as for surveying the level of knowledge of a group. The learners themselves can use this method to determine their own level of knowledge or to get feedback from other classmates or teachers (Villegas-Ch, Román-Cañizares and Palacios-Pacheco, 2020). Providers of this online method are Hubspot, Google Forms, and Survey Monkey.

Personal websites of teachers offer the possibility to provide learning content online. Forums, videos, or chat functions can make the website interactive. The difference with other online education methods is that everyone can access the information already provided, instead of just one person (Paudel, 2020).

3.5 Asynchronous and visual Online Education Methods

Arriving at the asynchronous and visual learning methods, I want to start with the first. Virtual classrooms offer an online learning space where a virtual teacher simulates a traditional classroom. Synchronous education methods like whiteboards or chats are used (Masalimova *et al.*, 2022). Providers for this form are Vedamo, WizIQ or Google Class-room (Jafarzadeh-Kenarsari, Abouzari-Gazafroodi and Zaersabet, 2019).

Quite similar is the use of online video channels. A great advantage of this method is that it can be prepared very well in advance (Abduvakhidov *et al.*, 2021). Training videos or training workshops can be organized and arranged according to topics or people. The video channels can later be made available on Internet sites such as YouTube, Vevo, or even Vimeo (Hong *et al.*, 2020).

In the direction of laboratory activities for various science subjects, virtual labs are suitable. Students get the opportunity to perform hands-on experiments to acquire skills (Doğantan, 2020). In addition, virtual experiments are cheaper and can save time (Arora *et al.*, 2020). Students gain hands-on

experience through virtual labs through simulated experiments and improve their understanding of lab equipment and test machines and their usage (Villegas-Ch, Román-Cañizares and Palacios-Pacheco, 2020). It allows learners to take tests independently and retake them as often as needed. Learners use state-of-the-art technology to conduct a series of experiments that produce real-world results (Arora *et al.*, 2020).

Teaching 21st-century skills require collaboration. According to studies, students who collaborate improve not only their subject knowledge, but also their problem-solving skills, creativity, and interpersonal relationships (Dwivedi *et al.*, 2019). Deeper learning occurs when students engage in dynamic, social, engaging, and student-led learning experiences (Finch and Jacobs, 2012). The benefits of collaborative student learning include: better preparation of students for social and professional circumstances Higher-order thinking, communication, and leadership skills are enhanced (Lazareva, 2018). Collaboration and synergy between students and faculty, student self-esteem, and persistence improved (Lazareva, 2018). Broader understanding from multiple perspectives when productivity tools and associated data are moved to the cloud opens opportunities for collaboration not possible with desktop applications. Edmodo, Classcraft, Yammer, Padlet, Parlay, Quizlet, Flipgrid, Kahoot, etc. are just a few examples.

Voice-over PowerPoint allows a lecturer to create a visual presentation and then record a comment or lecture content in real-time while the slides are displayed. Individual slides can, fortunately, be re-recorded without having to start from the beginning. The instructor controls when the slides continue for the viewer in the voice recording (Masalimova *et al.*, 2022). For online courses, the material is usually converted to streaming video for students to view. The spoken presentation can also be effortlessly uploaded online, and students can easily access it through the appropriate link (Werang and Radja Leba, 2022).

Flipped classrooms work so that students work their way into topics and later practice them in school with a teacher (Abduvakhidov *et al.*, 2021). It contrasts with the common practice that students practice at home and are trained in topics at school (Hong *et al.*, 2020). As a kind of blended learning variant, classical teaching is combined with technology (Dwivedi *et al.*, 2019). The online education methods that are often used are video lectures or online conferences.

4 Discussion

The authors of the literature used all have in common that the use of online education methods under the conditions of the pandemic is the right approach. It was not possible to continue conventional teaching. Online classes, therefore, offer students and professionals the opportunity to continue earning or learning. However, there is a need for discussion among the authors concerning the appropriate use of the methods. 84% conclude that online teaching cannot replace traditional teaching (Can, 2020). Studies among students clearly showed the same, that online or blended learning is not an alternative to traditional learning.

The framework for using online learning methods also requires the availability of equipment. The possibility of accessing online education with smartphones means that this is not an obstacle. However, it does limit the number of methods available. In addition to using private smartphones, most authors have in common that most students use personal devices to participate in online classes. In addition, the studies conducted revealed that there is a lack of agreement on the transfer of knowledge and experience of online teaching methods.

The use of synchronous and visual learning methods best counteracts these problems, but teachers do not prefer the use of synchronous teaching methods, whether visual or non-visual.

Which program or which platform is the most suitable for this can also not be said exactly. According to the literature, Google Classroom is the best option for communication. However, there is a big number of programs and providers.

Few authors have addressed the health aspects of online learning. The recommendation is that the use of online education methods should be limited to 3-4 hours. However, in the context of the literature review, health consequences of long-term online teaching are not tracked (Sheridan *et al.*, 2019).

However, there is a lot of discussion about social interaction as well as student sharing. The acquisition of social skills and communication of emotions and feelings is strongly influenced by online education methods. Many different approaches are provided for this purpose. For example, using small learning groups that can work independently and the use of mixed learning methods that are offered both online and offline. Under these circumstances, learning progress should be maximized as well as the development of social skills (Yulia, 2022). However, such a framework requires resources in the form of trained teachers. Another point of discussion is the digital training of teachers. The use of a virtual lab, for example, requires a certain level of knowledge that cannot be assumed. The extent to which training programs for teachers or students take place and under what circumstances must also be clarified. In the absence of technical understanding, the quality of the teaching method suffers.

The findings of the review are mainly reflected in the different characteristics of the teaching method, but also the framework conditions for a successful implementation. The general advantages and disadvantages of using online education methods are also presented. Furthermore, I have presented an overview of the currently existing and used online education methods as well as successful best practices approaches.

However, the inclusion and exclusion criteria used in the introduction and the methodology limited this literature review. Country-specific differences were thus not discussed and considered in more detail. Nor were subject-specific differences, such as in the areas of nursing or higher education, specified. In both examples, there is more in-depth research and papers that were not used in this literature review. Here, general possibilities for all application areas were considered. This also applies to the different framework conditions for the use of online education methods. The required infrastructure, technical skills, or the availability of devices and programs are not comprehensively addressed. The age of students also influences the possibilities of using online education methods.

5 Conclusion

Influenced by digitalization, but also by the Covid-19 pandemic, online education methods have become an integral part of education. Teachers and students are integrating various technologies into their learning process to make lessons more interesting. Using online education methods, students also can use modern techniques to prepare themselves for their future careers. The integration of technologies can therefore improve learning progress (Camargo *et al.*, 2020). However, the use of the right method plays a crucial role. Students and teachers prefer different methods. Technologically more sophisticated methods such as asynchronous and visual methods require a higher level of technical knowledge for those involved. On the other hand, the use of asynchronous non-visual methods is comparatively simple and requires less technical skill. In addition, among the methods available, it is also crucial how active the students are in the learning process. The more passive the worse. With the help of advanced technology, students should learn from home. Teachers and the management of educational institutions are constantly looking for new content, new possibilities, and new ways to make the learning process more interactive, interesting, and effective. Online learning allows students to learn beyond the curriculum. This type of learning is not without its challenges. Power interruptions and weak or non-existent network connections are some of the factors that hinder online instruction. In this difficult situation of the COVID-19 pandemic, online education has proven to be an effective method. The integration of online education methods plays an important role in the success of online learning during the COVID-19 pandemic. However, it cannot be considered an effective alternative to the traditional education system due to its technical weaknesses and lack of practical relevance. Above all, online learning requires good concentration, self-discipline, and self-motivation. There are several obstacles to online learning. If these obstacles are identified and removed, online learning will become more effective and enjoyable, especially if it is the only possible form of learning in an extraordinary situation such as a pandemic outbreak.

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