Universidade do Minho
Instituto de Educação

Cuina Sun

Current situation and future development vision of online courses

October 2024

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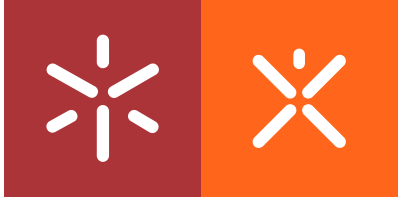
UMinho | 2024



Universidade do Minho
Instituto de Educação

Cuina Sun

Current situation and future development vision of online courses

Master's Dissertation
Master's degree in Educational Science
Area of Specialization in Educational Technology

Work under the supervision of
Professor António José Meneses Osório

October 2024

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THANKS

In my twenties, I was ignorant and naive. When I lived alone, the problems of life and my own problems were exposed to me nakedly. Huge things were thrown at me, and I had never learned how to resist. I was once shrouded by a sense of powerlessness and helplessness. The study of life was also imminent. I could not find any way out for a while, like a bird that kept hitting the glass window in an attempt to fly out. These knowledge that were not taught in school, I never stopped learning them and looking for the truth, I never stopped thinking about them. Good friends appear briefly like professors, and then they teach me something, or remind me, and leave again. I am very grateful to those friends who appeared and accompanied me when I was lost. They guided me to find the real problem countless times. These pointers are crucial. When I really understand where the problem lies, everything gradually becomes smaller. I thank myself, thank me for persisting until now, and thank myself for fighting for myself countless times, even though I have escaped many times. Not looking at it does not mean that it does not exist. On the academic road, I am very grateful to my mentor, Professor Antonio, who has been patiently guiding me, and his warm smile has given me a lot of strength. Good teachers are worthy of being cherished. They teach you with their heart, so that you don't have to suffer a lot of detours. Teachers are meaningful, and are like a beacon lighting up for you in the dark night. I am also grateful to my university. The university is like the wind, pushing my sailboat called growth to go further.

Anyone and anything mentioned above can be called a teacher. Sometimes a thing is a teacher, sometimes a friend is a teacher, and sometimes I am a teacher. I teach myself a lot of things. The teachers in school teach me precious professional knowledge. Education fills every corner of my life and makes me a better person. I am grateful for education as well.

STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration.

I further declare that I have fully acknowledged the Code of Ethical Conduct of the University of Minho.

Current situation and future development vision of online courses

Abstract

During the pandemic of COVID-19, universities were closed and students in universities had to use online course platforms for continuing their studies. Because of this, some problems in the online learning and teaching were identified. In this research, five articles about university students' perception of online courses have been involved in the analysis. Through the analysis, the problems figured out by these articles have been listed and the analysis result is used for helping universities to improve their online course design and other strategies which can be good for the popularization of online course. Through the document analysis of the five selected articles, the advantages and disadvantages of online courses have been figured out. The reasons why students do not like online courses and why some students can accept online courses have been listed. With the results in these articles, the research has stated that students' perception of online courses is decided by their experience with online courses and their knowledge for accessing online courses. Besides, the research results have shown that students accept online courses because of the advantages, such as time saving and flexibility. However, some students do not like online courses because of the disadvantages, such as lacking of interaction with other students and teachers in online courses and lacking of offline practice. These advantages and disadvantages impact on students' perception and show the direction for universities to improve their online course, such as the training of information technology, the changes in the course design and the role of teachers to support students' learning in online course.

Key words: online course, post-COVID, university students.

Situação atual e visão de desenvolvimento futuro dos cursos em linha

Resumo

Durante a pandemia da COVID-19, as universidades foram encerradas e os seus estudantes tiveram de recorrer a plataformas de cursos em linha para prosseguirem os seus estudos. Por este motivo, foram identificados alguns problemas na aprendizagem e no ensino em linha. Nesta investigação, foram analisados cinco artigos sobre a perceção dos cursos em linha por parte dos estudantes universitários. Através da análise, os problemas identificados por estes artigos foram listados e o resultado da análise é utilizado para ajudar as universidades a melhorar a conceção dos seus cursos em linha e outras estratégias que podem ser úteis para a popularização dos cursos em linha. Através da análise documental dos cinco artigos selecionados, foram identificadas as vantagens e desvantagens dos cursos em linha. Foram enumeradas as razões pelas quais os estudantes não gostam dos cursos em linha e as razões pelas quais alguns estudantes podem aceitar os cursos em linha. Com base nos resultados destes artigos, a investigação revelou que a perceção dos estudantes sobre os cursos em linha é determinada pela sua experiência com os cursos em linha e pelos seus conhecimentos para aceder aos cursos em linha. Além disso, os resultados da investigação mostraram que os alunos aceitam os cursos em linha devido às suas vantagens, como a poupança de tempo e a flexibilidade. No entanto, alguns estudantes não gostam dos cursos em linha devido às desvantagens, tais como a falta de interação com outros estudantes e professores nos cursos em linha e a falta de prática offline. Estas vantagens e desvantagens têm impacto na perceção dos estudantes e indicam a direção a seguir pelas universidades para melhorarem os seus cursos em linha, como a formação em tecnologias da informação, as alterações na conceção dos cursos e o papel dos professores no apoio à aprendizagem dos estudantes nos cursos em linha.

Palavras-chave: curso em linha, estudantes universitários, pós-COVID.

Table of Contents

COPYRIGHT AND CONDITIONS OF USE OF THE WORK BY THIRD PARTIES ii

THANKS iii

STATEMENT OF INTEGRITY iv

Abstract v

Resumo vi

Table of Contents vii

List of figures and tables ix

1. Introduction 1

    1.1 Research Background 1

    1.2 Research Rational 4

    1.3 Research Questions and Research Objectives 6

    1.4 Dissertation Structure 6

2. Literature Review 8

    2.1 Factors to Impact on Online Course Outcomes 8

    2.2 Students' Perception on Online Courses 11

    2.3 Changes of Online Course in COVID-19 13

    2.4 Synthesis 15

3. Methodology 16

    3.1 Research Philosophy and Research Approach 16

    3.2 Research Strategy and Research Design 17

    3.3 Data Collection and Data Analysis 18

    3.4 Ethical Consideration 20

4. Findings 21

    4.1 Form of Online Courses 30

    4.2 Elements for Evaluation 31

    4.3 Students' Perception of Online Courses 35

4.4 Synthesis 40
5. Discussion 41
5.1 Acceptance of Online Course among Students 41
5.2 Change of Students' Perception of Online Courses 42
5.3 Changes and Improvement of Online Courses during COVID-19 44
5.4 Synthesis 45
6. Conclusion and Recommendation 46
6.1 Conclusion and Limitation 46
6.2 Recommendation 47
6.2.1 Recommendation for Online Courses 47
6.2.2 Recommendation for Further Study 48
7. References 50

List of figures and tables

Figure 1 Impact of COVID-19 on Education Sector (Bryant et al. 2022) 1

Figure 2 Number of School Weeks by Type of Learning (Bryant et al. 2022) 2

Figure 3 Framework of student performance in online learning setting (Prabowo, et al., 2022) 4

Table 1 Paper Identity 19

Table 2 Paper Description 19

Table 3 Paper Identity 22

Table 4 Paper Description 23

Table 5 Major Elements in Questionnaire 32

Table 6 Perception of Students and Elements to impact on remote learning outcome 36

1. Introduction

1.1 Research Background

During the pandemic of COVID-19, there were various things changed all over the world. The impact of COVID-19 was found in different areas and the education sector is one area which has been impacted seriously. According to the data provided by McKinsey (Bryant et al. 2022), COVID-19 had caused school closures for at least 30 weeks during the pandemic (as shown in Figure 1). For dealing with the situation of quarantine and school closure, online learning or remote learning has been used by schools in different countries. As shown in Figure 2, schools in different countries have involved four types of learning during the pandemic of COVID-19, namely in person, partially open, remote and academic break. Compared with the data of school closure and remote learning, it is found that remote learning was the solution for the school closure during this period.

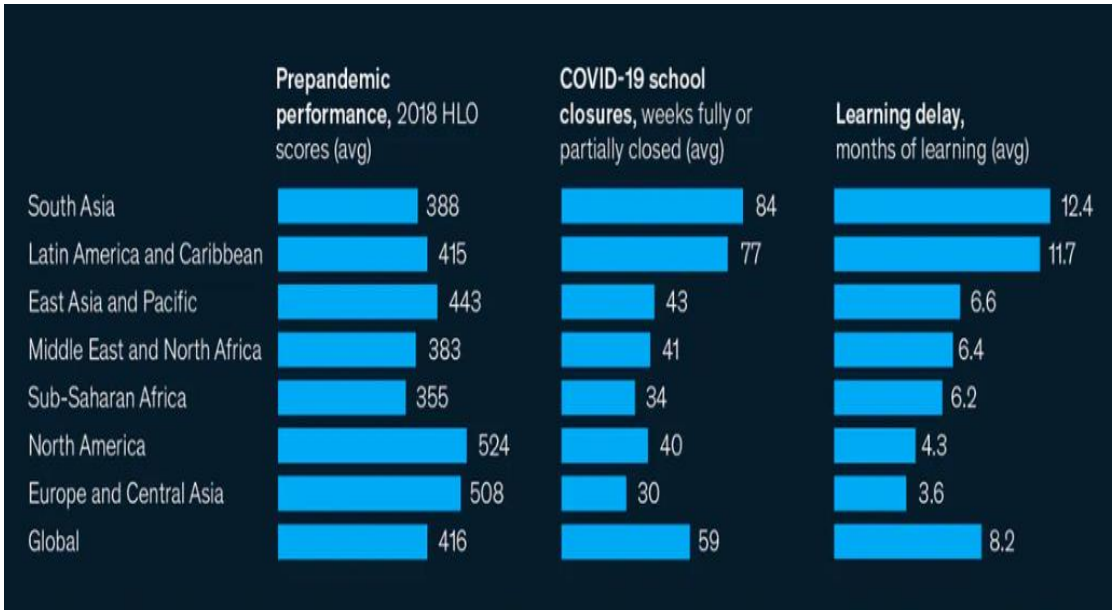

Figure 1 Impact of COVID-19 on Education Sector (Bryant et al. 2022)

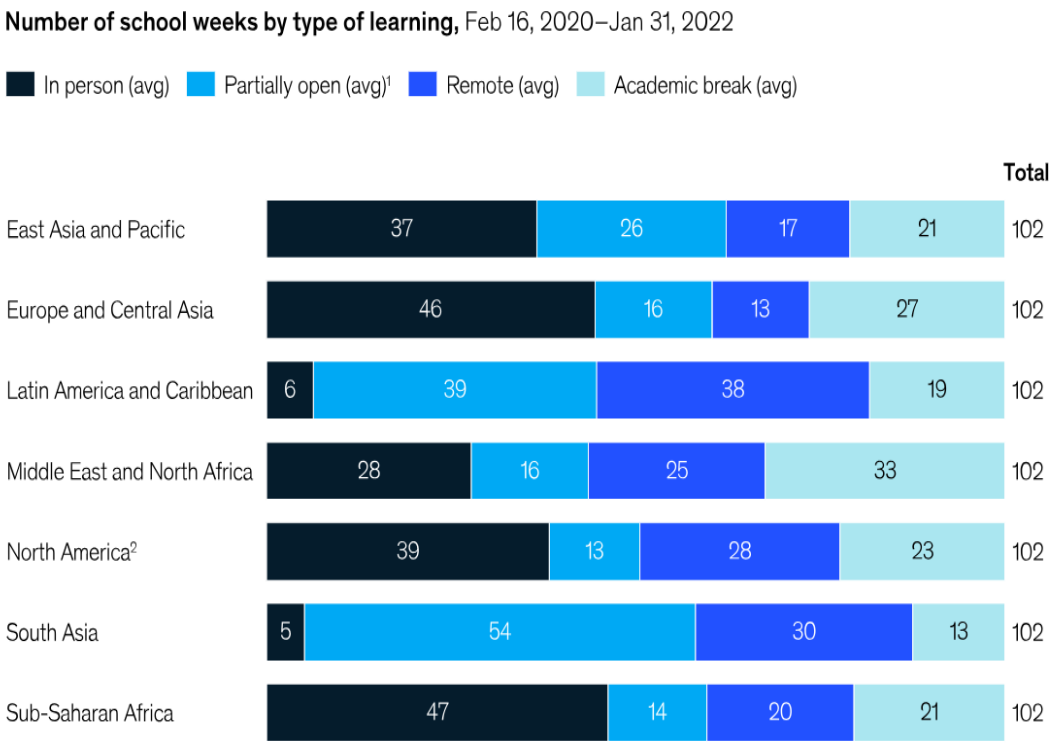

Figure 2 Number of School Weeks by Type of Learning (Bryant et al. 2022)

Online courses have been used for several years with the development of internet. Before the COVID-19, online courses was not the regular form for higher education. The Massive Open Online Courses (MOOCs) was the major form of online courses for higher education before the COVID-19. Nevertheless, the way for MOOCs to improve students' performance was mainly implemented through self-regulated learning intervention (Jansen, et al., 2020). Different from online course during the COVID-19, MOOCs before the COVID-19 did not give the pressure of exam to online course students. Therefore, students of MOOCs before the COVID-19 need to have a stronger motivation or self-regulation (Jansen, et al., 2020). During the pandemic of COVID-19, learning ability and learning performance of students have been impacted due to school closure. On 13 March 2020, the Portuguese Ministry of Science, Technology and Higher Education announced the closure of all higher education institutions to mitigate the spread of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). All activities were suspended on 16 March until the end of the academic year (MCTES, 2020). Although schools have arranged online courses, students did not perform well with online learning (MCTES, 2020). In the study about students' performance in online course during the

COVID-19 at King Saud University in Saudi Arabia, the result shows that university students with online course have a lower score in most courses (Alarifi & Song, 2024). Bettinger, et al., (2017) stated that university students with online courses have a lower level of academic success and the lower academic achievement through measuring by grades.

The reason for the poor performance of students in online course during the pandemic of COVID-19 was related with several elements. Some studies have stated that home environment and emotional intelligence impacted on student's boredom and depressive thoughts (Chandra, 2021). These emotional elements had an impact on the academic performance of students during the pandemic of COVID-19. Besides, the home environment and the adoption of new technology for online courses impacted on university students' academic performance (Realyvásquez-Vargas, et. al. 2020). A study by Xhelili, et al. (2021) stated that university students have a more positive attitude towards offline classroom learning than their attitude towards online courses. Their academic performance is impacted by these elements.

According to Prabowo, et al. (2022), different elements impact on the final outcome of students' performance in online courses (as shown in Figure 3). Through these elements, the final academic performance is decided. These elements are about the quality of the course, instructor factors, the individual factors of students, institutional factor and the technological issues. In the individual factors, the characteristics and self-efficacy of students also decide their learning outcome in online courses. Besides, a report by the World Bank (2021) stated that the family environment for students when they have online course also impacted on the individual's academic performance. If students cannot have the suitable environment for learning or they cannot have enough resources for online course, they cannot study well in online course.

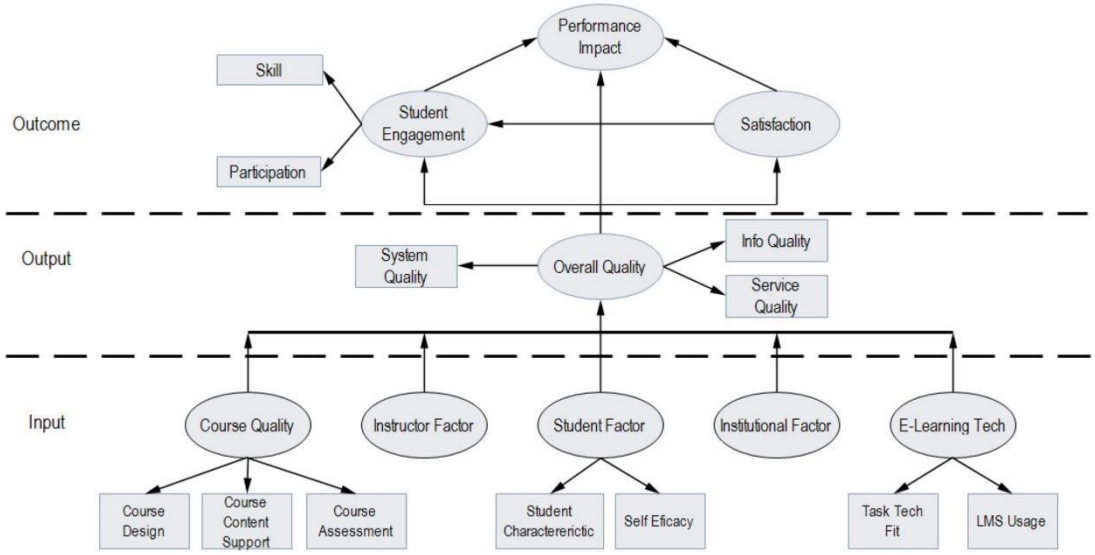

Figure 3 Framework of student performance in online learning setting (Prabowo, et al., 2022)

Based on the framework of student performance in online learning setting, there are several different groups of factors impacted on the academic performance of students. These factors also impact on students' experience during the online course and their perception of online course. For instance, Nambiar (2020) stated that quality and timely interaction, technical support and online course design impact on students' perception towards online course. While Landrum (2020) stated that self-regulation of students and their learning skills in the online course also impacted on their satisfaction and perception of online courses.

1.2 Research Rational

Data from different studies about online course and students' performance has shown that students' learning ability and their academic performance with online courses were not as good as in the offline classroom (Bettinger, el. Al., 2017). Due to the development of internet technology and popularity of remote learning, online courses become the main learning method for children and adults in the future (Dhawan, 2020). Therefore, to identify the advantage and disadvantage of this learning method is necessary for having further improvement. In the past years, online courses have been used as the main channel for students to continue their learning. According to study conducted by Tosto, et al. (2023), students in different demographic groups have different perception of online course. For instance, black students have a higher level of preference for Zoom class while Hispanic students

prefer asynchronous classes online. International students like online courses because they can learn at their own pace. However, they have also stated that online courses reduced their interaction with other students while domestic students stated that online courses reduced their interaction with teachers. Different groups of students have different perceptions of online course. Therefore, to have the study about students' perception of online course and how to satisfy university students is important for online courses.

Besides, there are lots of benefits of online courses. With the development of information technology, online courses can benefit people all over the world for supporting their learning in different places. Some universities or countries are good at some majors. With online courses, students in other countries and other areas can get the resources easily (Ciano, et. al. 2022). For optimizing the outcome of online courses, it is important for figuring out what should be improved and what should be strengthened. Based on the data from the pandemic of COVID-19, the research aims to identify students' perception on online course and the factors of online courses which should be improved. Through the analysis of these elements, the impact of different elements will be identified. How the elements impact on student's perception and their academic performance in online courses will be identified. With the research result, what universities should do for improving the outcome of the online course will be identified. Current state of online courses after COVID-19 has changed everything and it formed the trend in the future (Pregowska, et al., 2021). However, not every student can feel well with the online courses. Therefore, it is important to find out the reason of student's poor academic performance in online course. This study learned and synthesized students' attitudes and perceptions about online courses, analyze the advantages and disadvantages of online courses, and explore more possibilities for future development based on students' needs. Through this study, the thoughts of university students will be investigated. Based on their thoughts, the elements of online courses which should be improved and how to be improved will be identified.

1.3 Research Questions and Research Objectives

Based on the research background and research rational, the purpose of this study is stated. The purpose of this study is to figure out the direction for improving the performance of online courses. Thus, the research question for this study is,

What should be done for improving the quality of online course in the post-COVID period?

The research objectives are:

A. To figure out students' acceptance of online courses.

B. To identify the factors which can impact on the using of online courses among students in different conditions.

C. To investigate students' perception of online courses.

D. To view the changes of online courses during and after the pandemic of COVID-19

E. To make recommendations for improving online courses for different types of students.

Based on these objectives, this research will be designed and the data will be collected properly.

1.4 Dissertation Structure

There are six parts for this dissertation. Introduction is the first part. In this part, current situation of online courses and some background information of online courses were introduced. Besides, the meaning of this study was discussed in this part. Why this study is made and what it expected to achieve can be concluded. Also, research questions and research objectives were addressed in the introduction. Following this is literature review. In literature review, different studies about online courses and the factors which impact on the final outcome of online courses will be analyzed. Moreover, some studies about students' perception of online courses and the factors which impact on their perceptions will be discussed. Based on the literature review, the overall situation of online courses and students' perception will be conducted. The third part of this dissertation is methodology. In the methodology, methods which are used for this study will be introduced. In this study, studies

about different situations of students in different countries will be involved into the analysis about their perception of online courses. It is impossible for the author to invite students from different countries for doing this research. Thus, studies with this topic will be collected. Document analysis will be made for conducting the findings of these studies. The fourth part of this dissertation is findings. In the findings, different researches about students' perception of online course and the factors which impact on students' performance in online courses will be analyzed and concluded. Answers of research questions are expected to be found from these findings. The fifth part is discussion. With analysis results in findings, research questions are answered in this part. The final part of this dissertation is conclusion and recommendation. The whole study will be concluded. Findings from the study and limitation of this study will be conducted. With the conclusion, recommendations for further studies and for online courses designers or different educational institutions will be made.

2. Literature Review

In this part, some studies about online courses and the perception of students on online courses will be discussed. The basic concepts of online courses and the factors which impact on the outcome of online courses will be identified in this part. Furthermore, students' perception on online courses will be concluded from some studies. Whether they like it or not and what factors they prefer in the online courses will be concluded from these studies. Following this, studies which investigate the course design and other elements in online courses during COVID-19 will be compared in this study. Through the conclusion of these studies in literature review, the further development of online courses for different types of people will be investigated. In this part, the basic concepts and general research results will be concluded.

2.1 Factors to Impact on Online Course Outcomes

In fact, there are various definition of online courses (Singh & Thurman, 2019). In the past three decades, online courses and technology used for online courses have a lot of changes. With development of internet technology and lifestyle changes, online courses have some changes. The advanced internet network and other information technology allow more people to receive online education. However, due to some limitation of online learning and historical perception about the online education practice, online courses have not been considered as a informal method for higher education. However, this situation has been changed during the pandemic of COVD-19. Online courses are related with the concept of online learning, internet learning and distributed learning, etc. According to Grechushkina (2018), there are some features of online courses, including the e-pedagogical approach, interaction of participants, period of study, way of organization, purpose of learning and the way for accessing to the course. Based on these features, online course has been defined as the the educational process which is organized based on e-pedagogy and means of information technology. Through the system of electronic means, online course can provide the training resources and means of monitoring to students. In the pandemic of COVID-19, almost all the universities and schools in different countries have used online courses to continue their teaching and

learning activities. As stated in the Introduction part, hours spent on remote learning have increased in the past years. Because of this, more studies have focused on how students perceive this method and how to make this method to be more effective. The sudden shift from offline course to online course has led to some problems among university students. For instance, in the study conducted by Xhelili, et al., (2021), findings showed that the shift to online course caused intense stress on students. It is hard for students to have a positive attitude towards online course if they did not adapt this teaching and learning method well. Some universities have noticed this problem in practice and they have some strategies for solving this problem. Prasetyo, et al., (2021) made the study for investigating how universities deal with the problem in online courses. In the study, the results show that universities care about students' readiness and their interest in online learning. Besides, some universities paid more attention to the course design for creating innovative online learning method. Online course design is an important strategy for universities to improve students' interest and their readiness.

There are different course design methods for online courses. In general, the online course is the text-centric one or the interaction or incorporate one (Wright, 2014). The communication between students and teachers is different with these methods. Moreover, for having the effective online courses, there are various factors are considered. According to Porter (2004), online courses have certain differences between traditional offline class. Nevertheless, due to the social environment, lots of offline classes use online information source or other supportive methods of information technology. In this circumstance, the online courses are defined clearly. Porter (2004) stated that online courses are learning and teaching activities which have been carried out online. Students can have online learning by themselves or teachers and students can have the common online meeting time for group activities and interaction. In the past, online courses were used for the self-learning. In this circumstance, the outcome of the online courses is related with the self-regulated behaviour of self learners. As stated in the studies about Massive Open Online Courses (MOOCs), self-regulated behaviour is important for online course learners. Jansen, et al., (2022) stated that learner's self-regulated learning behaviour impacted on their performance with the same course. Nevertheless,

Viberg, et al., (2020) stated that self-regulated behaviour is also supported by the online learning environment and teaching support. Therefore, how to design the online course and how to provide the support to students in online courses are investigated for improving the academic performance of students.

Nevertheless, there are other factors should be considered for improving the outcome of online courses. Alqurashi (2019) stated that the online learning self-efficacy, learner-content interaction, learner-instructor interaction and learner-learner interaction should be considered in the design of online courses. These elements impact on the perception of online courses and then impact on the satisfaction and perceived learning in online courses. Moreover, based on the study about Massive Open Online Course, Albelbısı and Yusop (2019) stated that self-regulation can be important in online learning. Besides, the course quality, attitude and service quality of the online courses can decide the outcome of the self-regulated learning.

Based on the discussion, it is stated that the online course design and the interaction in the online courses can impact on the outcome of this learning method. The interaction between learners and instructors and between learners was not involved in the design and recording of the online courses in Massive Open Online Course. But during the pandemic of COVID-19, online courses have been used by schools and universities. Therefore, the course design and the teaching activities were carried out by teachers and instructors who are not familiar with the online course design. Moreover, the online courses during the pandemic of COVID-19 need to meet some challenges. Students and teachers who are familiar with face-to-face courses have to interact with each other online. The design of the course, the delivery of the course and the student engagement tool in this period impact on the outcome of online courses and students' perception of this learning method (Khan, Egbue, Palkie & Madden, 2017).

2.2 Students' Perception on Online Courses

Students' perception of online courses are impacted by some elements. According to Agung, et al (2020), students' perception of online courses is impacted by students' participation in the online course, accessibility, material and assignment delivery and the use of online learning platforms. These elements impact on the experience of students and then their perceived usefulness and attractiveness of online courses. Due to the features of online courses, students do not have the effective interaction with their teachers and classmates. Therefore, how to improve the experiences of students and how to make them to have a better learning performance in online courses should be considered by the online course design. Rojabi (2020) emphasized the importance of online learning platforms. Through using Microsoft Teams, students can have a better interaction and learning environment. Because of this, students can be motivated and have a better perception of online learning. Moreover, the advantage and disadvantage of online learning also impact students' perception of online courses. Students are interested in some elements of online learning, such as the interesting learning videos and fun learning strategies. However, these are some problems which can impact on the perceived outcome of online course. For instance, Saleh, et al (2021) stated that the online courses have less effective and decreased enthusiasm. Interaction between students and lecturers and the control from lecturers are reduced by online courses design. Choi, et al., (2021) also stated that communication between lecturers and students is important for improving online course performance. Through the communication, lectures can know better about students' opinion for the online course design. Some students think that it is hard to understand the materials of the online courses (Surani & Hamidah, 2020). This opinion should be considered by lecturers when they are designing the online courses. Lacking of communication and interaction is also the reason for why students cannot understand the materials properly.

Lacking of communication and interaction makes students think that they are not engaged or involved in the lecture. Due to the limitation of technology and online course environment, it can be hard for lecturers to have regular communication and interaction as they are in the offline course. The study conducted by Nurdiyanti, et al (2021) has also stated that the interaction between students and

lecturers and the interaction with teaching materials impacted on students' perception of online courses. Moreover, the ability of learning independently and peer interaction in online courses have certain influence on students' perception. Study conducted by Nurdiyanti, et al (2021) stated that students were willing to have online course because of the flexibility. However, their perception of interaction in different types can be negative. In general, students stated that they had a better perception of face-to-face learning than online courses based on the consideration of social presence, social interaction and satisfaction (Bali & Liu, 2018). Furthermore, the stability of internet can impact on the experience and satisfaction of students and then impact on their perception.

In the study conducted by Martin, Stamper and Flowers (2020), students' perception of online courses has been discussed with their readiness for online learning. The research result shows that the perception of online learning is divided into several competencies, including online student attributes, time management, communication and technical. Student's perception towards these competencies impact on their perception of readiness for online learning. However, some other elements also impact on students' perception, such as the race of the students and course format. Course formats are divided in to asynchronous, synchronous and blended. These different formats are related with different interaction or other course activities. These differences impact on the experience and satisfaction of students. Other studies have examined different elements in online learning. For instance, Cranfield, et al (2021) stated that home learning environment, students' engagement in online courses, participation preference and learning skills impact on students' perception of online course during COVID-19. These elements impact on students' experience and their satisfaction in the courses. Furthermore, Bagata (2020) stated that the gender differences also impacted on students' perception of online courses.

In general, it can be stated that the perception of online courses is related with students' perceived readiness of online courses and their experiences with online courses. The elements which impact on student's experience involve the choice of online course platforms, learning skills, interaction in online courses, material and assignment delivery, time management and external environment. Due to the

features of online courses, students do not have as much social interaction with others as in the face-to-face offline courses. Therefore, their understanding about the teaching materials and their learning skills impact on their outcome in online courses. Students' perception of online courses is related with their perceived outcome of online courses. However, during the pandemic of COVID-19, some elements have been changed and students' perception have been changed in this period. The changes of the online course elements and student's perception will be discussed in the following part.

2.3 Changes of Online Course in COVID-19

During the pandemic of COVID-19, online courses have been used by schools and universities for keeping their teaching and learning activities. However, not every university or school has the suitable facilities and resources for having the effective online courses. According to Zhao and Watterston (2021), there are some changes should be carried out for online courses. These changes are about the curriculum, pedagogy and delivery of instruction. For having an effective online courses, the curriculum should focus more on the personalized and developmental design. Also, pedagogy should be student-centered, purposeful and inquiry-based. During the online course design, lecturers should consider about the strength of synchronous and asynchronous learning. With the combination of different learning methods, the effectiveness of online course can be improved. Through the practice in the pandemic of COVID-19, some challenges and improvement of online courses have been concluded. According to Li (2022), there are some perceived benefits in online courses, such as the online learning community and the improvement of students' digital learning skills. Also, with online courses, students have the online connection during the lockdown period. However, for making the online courses to be more effective, there are still some issues should be considered, including the time management and social media distracted. Students involved in the study conducted by Li (2022) prefer the combination of online courses and offline courses. In the post-COVID era, schools have a rich experience in online courses. Therefore, they can combine online and offline courses for improving the final outcome. It is the trend for the future. In this circumstance, universities and schools need to figure out what should be involved for improving online courses. According to

McQuirter (2020), technological support should be offered for developing online courses in the post-COVID period. According to Simamora (2020), there are some changes found in the online course after the pandemic of COVID-19. After the practice during the pandemic of COVID-19, Simamora (2020) stated that online courses should consider about the combination of different instructions for improving the outcome of online courses. Moreover, online learning skills of students and other elements which are related with the experience of online courses should be improved. Besides, other studies have conclude the practices during the pandemic of COVID-19 and state that universities should consider about some healthy habit, motivation and social connection among students (Gonzalez-Ramirez, et al., 2021); Mishra, Gupta & Shree, 2020). Furthermore, different from the period before COVID-19, online courses is the only choice for schools in a certain period during the pandemic. In this circumstance, the psychological status of teachers should be concerned (Ma, etl al., 2021). Besides, Ma, etl al. (2021) stated that teachers' online teaching self-efficacy for technological application has been increased during the pandemic.

Based on these studies, the common changes of online courses are concluded. In general, the pandemic of COVID-19 has improved the practice of online courses. From the technological support to the course design, schools and universities have concluded some experiences for improving the performance of online courses. Besides, students' perception, experience and their feedback in online courses can be the reference for schools and universities to improve their online course design. The most important is that online courses practice during the pandemic has shown the direction for the future. Students and teachers can accept the combination of online course and offline course for having the most effective outcome. However, it should be realized that students' perception of online courses is still impacted by many different factors, such as their readiness of having online courses, their experience and their satisfaction. Besides, some external elements impact on their perception, such as the environment they are in when they have online courses. These elements have not been changed after the pandemic of COVID-19.

2.4 Synthesis

In this part, some studies about the online courses and students' perception of online courses have been discussed. Based on these studies, the general situation about online courses and student's perception towards online courses have been concluded. These studies have shown the students do not have a positive perception towards online courses. Compared with offline courses, online courses have some problems which are related with its natural characters. For instance, participants in online courses have fewer interactions. Besides, the quality of the materials, the control from lecturers and quality of facilities for having online courses impact on their perception of online course. During the pandemic of COVID-19, schools have more experience with online courses. Besides, students have experience online courses during these years, their perception and their learning skills with online courses have been changed. Flexibility and time management can be the significant advantages which are preferred by students. Based on these studies, it is concluded that there are some elements should be improved for having a better outcome in online courses. Nevertheless, studies in the literature review can state the general situation in this field. A further in-depth analysis about students' perception of online courses should be made. The in-depth analysis will be made in this research and the details about how data was collected will be discussed in the following part.

3. Methodology

In the part, methodology used for this study to collect data will be explained. In this study, students' perception of online courses, their acceptance of online courses and changes during the pandemic of COVID-19 in online course field will be identified. The key for the study is about how students think about online course. Their thoughts about online course are about their acceptance of online course and their perception about how the effectiveness of online course in their study. How they feel about the online course and how they perform in online course. However, students' perception and performance in online course can be impacted by some elements, such as facilities and course design. Because of this, students' thoughts about online course are various. In this circumstance, for identifying how students think about online course and whether their thoughts have been changed after COVID-19, the research will be designed for collecting data to answer these questions. The changes of their thoughts can be related with certain evolution of online course during this pandemic of COVID-19. For having a completed vision about how students in different countries think about online course, data from different countries was needed. For collecting data about these factors, the methodologies should be chosen based on the demand of the research. In this study, due to the limitation of resources, no primary data will be collected. Instead, the secondary data will be collected from current literature and analyzed for answering the research questions.

3.1 Research Philosophy and Research Approach

In this study, the secondary data will be analyzed. According to the research questions, the research will focus on the acceptance of online courses and student's perception of online courses. These elements are about students' thought and their attitude. Therefore, it will be interpreted. The attitude and the thinking of students towards online course do not have a common standard or the unique rule. Therefore, the research will collect the in-depth information which explains certain behaviour of human beings. In this circumstance, interpretivism philosophy is more suitable for this study. With interpretivism, qualitative data will be collected for explaining the differences in some social realities (Alharahsheh & Pius, 2020). Through the interpretivism, qualitative data which describes the

phenomenon of the social reality and the in-depth analysis about the phenomenon can be made based on the qualitative data. With interpretivism, qualitative data about students' perception of online courses and the online course changes will be collected in this research. This kind of qualitative data is about the social phenomenon and human's behaviour and feelings. Human's behaviour is impacted by some external elements. However, the impact is different from one person to another because of their thought or their perception. Therefore, there has no general rule for explaining the same impact on different people. In this study, the qualitative data about students' perception and the change of online courses after COVID-19 show different situations among students. These situations are not the same and they should be interpreted separately. Studies about students' perception and how they think about the changes of online course during and after the pandemic of COVID-19 are involved in this study.

With interpretivism, inductive approach will be used. With inductive approach, the study will be started from the phenomena or the cases instead of theories or common rules. Inductive approach is mainly used with the qualitative data (Azungah, 2018). In this study, the qualitative data about students' perception of online course will be collected and analyzed. This research focused on students' thought and the elements which impact on their perception about online course. For different countries, the result and the perception are not be the same. The research will not conclude the unique model for improving the performance of online courses. Instead of finding the unique model, this research will focus on interpreting the impact of different elements on students' perception of online courses.

3.2 Research Strategy and Research Design

This research will be done based on the secondary qualitative data. With interpretivism and inductive approach, the secondary data from current literature will be collected. For finding the suitable articles for this study, key words for article searching on Google Scholar were selected. These key words involved Europe, higher education, online courses, COVID-19 and student perspectives. These key words outlined the focus of this study. These key words figured out the objects for the studies, the

period of the studies and the institutions involved in the study. Through these key words, the suitable articles could be selected. However, during the process, the key word, Europe, could not lead to articles about online courses and students' perception in European countries. Therefore, the selection of articles has been done based on the searching of different particular countries in Europe. The target sample population of this study is university students. Their thoughts will be concluded from the articles analyzed in this study. All the articles are about students' perception and related influential elements on their attitude towards online course in Europe. Besides, the articles are all about the perception of university students. University students are the population of the samples in this research. Their perception and their experience in online course during COVID-19 were analyzed by different articles.

Through the selection of articles, five articles have been chosen for making the analysis. These articles meet the requirement of the selection. The sample population and the area they focus meet the requirement of this study. The sample population of the selected articles are university students in European universties. University students can express their idea better for discussing their thought about online courses. Findings from these researches support the discussion about university students' perception towards online course after the pandemic of COVID-19.

3.3 Data Collection and Data Analysis

Based on the research strategy, the data collection method and data analysis method will be explained. With systematic research, some articles will be selected from Google scholar. In the process of article selection, sample population, research questions and key words of the articles are considered. With these results, the changes of online course and students' perception will be concluded. After selecting some articles, the analysis will be made. Document analysis will be used in this study for making the data analysis. Interpretive document analysis will be used for dealing with the articles selected from this study. Interpretive content analysis will not analyze the data simply through counting the similar results or the different results (Patra, et al., 2020). Instead, interpretive document analysis can investigate into the textual information involved in the articles and interpret

the result of the article. Through the textual information and comparison of the results, these articles will be compared and the answers of the research questions will be found. For answering the research questions, articles will be divided into several groups, including students' perception of online courses, influential factors for online courses and changes of online courses after COVID-19. Different studies will be concluded, analyzed and compared. The analysis will be made based on the contents listed in the following tables.

In Table 1, the basic information of the articles selected for this study will be introduced, and number them for clearer use and presentation of the following tables. In Table 2, the main contents of the articles selected for this study will be introduced, which will be more understandable and more specific research content.

Table 1 Paper Identity

Paper/ Text	Title	Authors	Year	Journals	Key words
1					

Table 2 Paper Description

Paper/ Text	Research purpose	Method	Sample Population	Research process	Main Findings	Limitation
1						

Through the discussion of these articles based on these factors, the general attitude of university students in Europe will be concluded. How they think about online course and how different elements of online course impact on their perception will be concluded from these articles. The comparison will also be made for identifying how students' perception and their thought about online course is changed. Through these studies, the research questions will be answered.

3.4 Ethical Consideration

In this research, all the data is secondary data. Therefore, the major ethical considerations are about the plagiarism and the permission of using the secondary data. In the document analysis, findings of different researches will be quoted for making the analysis. When the articles are quoted and discussed in this dissertation, the clear quotation of the article should be made. Besides, the dissertation had the in-depth analysis about the contents of the articles and make some comparisons of these contents. Instead of quoting the contents directly, the interpretation of these contents should be made. In this way, plagiarism can be avoided. Besides, in the background introduction, there are some indexes and charts from different reports. The permissions from the writers of these reports are needed for the ethical consideration. Therefore, emails have been sent to these writers of these reports for getting the permissions. Findings of these articles and the findings from different online reports will be reported and analyzed in this dissertation.

4. Findings

In this part, the findings and other facts listed in different articles were presented. Findings of different studies will be interpreted and compared for answering the research questions. The basic information of these articles are shown in Table 3 and Table 4. Also, the findings of these articles have been listed in the second table. Through these two tables, the findings of these studies are reviewed quickly.

Table 3 Paper Identity

	Paper/ Text	Authors	Year	Journal	Key words
1	Hybrid and Online Synchronous Delivery of Environmental Engineering During COVID-19 Pandemic: A Comparative Study on Perception, Attitude, and Assessment	M. A. Karim	2021	European Journal of STEM Education	hybrid, online synchronous delivery, COVID-19 adjustment, students' perception and attitude
2	Remote Learning in Higher Education: Evidence from Poland	Józef Ober and Anna Kochmanska	2022	International Journal of Environmental Research and Public Health	remote learning; quality of education; level of knowledge; higher education; COVID-19 pandemic
3	The Mystery of Remote Communality: University Students' and Teachers' Perceptions During the COVID-19 Pandemic	Satu Uusiautti, Sanna Hyvärinen & Sina Björkman1	2021	Human arenas	Communality, Sense of communality, University community, COVID-19, Remote work, Online interaction
4	Portuguese higher education students' adaptation to online teaching and learning in times of the COVID-19 pandemic: personal and contextual factors	Maria Assunção Flores1 et al	2022	Higher Education	Higher education, COVID-19, Online teaching and learning, Students, Adaptation process
5	COVID-19 and dental distance-based education:	Paola Di Giacomo and	2021	BMC Medical Education	Distance-based education,

	students' perceptions in an Italian University	Carlo Di Paolo			Dentistry, COVID-19 pandemic

Table 4 Paper Description

Paper /Text	Research purpose	Method	Sample Population	Research process	Main Findings	Limitation
1	This study focused on perceptions and attitudes of students in Civil and Environmental Engineering program.	There are two instrument for collecting information. One is online anonymous survey with five questions. These five questions are about students' perception and attitudes about different elements in online course and online exam. The	76 participants are involved in this research. They are from different grades. Some of them have experience the pre-COVID-19 offline courses. In this way, the differences between online course and offline course.	The survey has been carried out after the semesters which students have the online exam because of COVID-19.	No significant difference or negative attitude towards online course has been identified. Students think that online synchronous delivery is a justifiable option.	The major limitations are about the research bias and simple sample population. The author is the only person to design the study, so it cannot avoid the personal bias. Besides, all the students involved in this study were all from the same engineering program. Thus, the

		second instrument is used to investigate the scores of participants in this study.				result of this study can show how students in this program feel and think about online courses.
2	To evaluate remote learning based on student's perception.	A survey with sixteen mixed survey questions.	Altogether 999 students have been involved in the survey, including 518 female students and 481 male students. Most of these respondents have 1 to 2 years experience with remote learning and they are the full-time	The survey with sixteen mixed questions have involved four dimensions for the evaluation, including socio-emotional, developmental, time-financial, and negative attitude. These dimensions contribute to the evaluation of remote learning.	There are several advantages of remote learning, including saving time and commuting cost, studying at a university in other countries or cities and combining work and study. There are also some disadvantages, including lacking of social ties with	The sample population is too simple. One university in Poland has been involved in the research. Only students from higher education institutions have been involved in the research. It makes the universality of the research result being low.

			students for their first degree		peers, exhausted feeling related with excessive use of information and communication tools and distraction in different forms. These elements impact on the outcome of students' remote learning.	
3	This study aimed to examine how the COVID-19 pandemic affected the communality among university personnel and students	Data for this study has been collected from 7 surveys which involved The survey questions involved satisfaction with remote and hybrid work and communality and participants' experience with remote working and remote	339 students and 133 university staffs in a northern Finnish university.	Data for this study has been collected during March 2020 and June 2021 with 7 surveys. Different participant groups have answered some questions about their experiences and thoughts about remote working and remote	The findings of this study stated that students, teachers and university staffs have different sense of communality in remote working and learning. However, they have the similar sense for flexible interaction and availability of remote	There are several limitations in this study. This study involved one university only. The response rate of the students is low. The communality in this research has been measured by one simple structured

		learning.		learning.	working and learning.	question. Therefore, only the frequency has been used for analyzing this variable without any in-depth analysis and discussion.
4	This research aimed to figure out higher education students' thought about the closure of their institution and how they accept online learning based on their experience.	A survey designed based on teachers' experience with remote working has been used for this study. There are all together three sections in the survey, including perception and experience with condition, process and assessment and feedback of online	Altogether 1535 students from higher education institutions have been involved in the study. They were from all areas of knowledge and different cycles of study.	The questionnaire has lasted from June 12 to August 12,2020. The link to the survey has been created through Qualitrics and sent to students via students' union.	Findings show that both personal and contextual factors impact on student's acceptance and their perception of online teaching and learning. These factors are about institutional and pedagogical responses, individual self-regulatory and socio-emotional	This research has mentioned self-regulatory in online learning. But the further study about the relationship between self-regulatory and self-efficacy can be investigated. Moreover, teachers' role for supporting online learning has been

		teaching and learning.			competencies and adequate resources. The positive or negative experience with these factors decide students' perception of online teaching and learning in tines of COVID-19.	studied from students' perception. How teachers understand this teaching approach and what they have done for supporting students in this teaching approach have not been investigated in this study.
5	The purpose of this study is to investigate dental faculties students' perception about the complete transition to distance-based education and the	An anonymous online questionnaire has been done in this study. 24 open and closeended questions are involved. These questions have been divided into several	Students who had online courses of the faculties of Dentistry and Oral Hygiene at Sapienza, University of Rome were involved in the	The survey has been uploaded into some online platform and the link has been sent to students' institution email. Students in the selected university have been informed about the	Findings of this study state that the common complaints about the online course among Dentistry students is about lacking of a structured online curriculum, less	The research has figured out how Dentistry stduents and Hygiene students at Sapienza, University of Rome consider about online course. This research has identified

	strategies they have for adapting online learning during pandemic of COVID-19.	parts, including participant profile, environment and suitability of the online platform, the quality of lessons and methods used and impact on mental and physical sphere. Also, the questionnaire involved some open-ended questions for comparing the in-class lessons and the distance-based ones. Also, students' conconsers, level of satisfaction, suggestions and	questionnaire. 314 students took part in the questionnaire.	research.	interaction with professors and the lower level of attention. These factors impact on the quality and quantity of acquired knowledge.	the importance of considering the demand of students in practice. However, this article has not explored deeply in this area.

		positive and negative aspects of distance learning.				

Findings of these articles have listed some complaints and positive attitude of students towards online course. Experiences of students with online course before and during COVID-19 have been concluded. Based on the findings of these studies, influential elements of students' perception and changes during the COVID-19 can be identified. From Table 4, it is found that there are some similarity among these studies. But the differences of these studies should not be ignored. These differences are the differences of sample population and online course forms. Because of these differences, participants in these studies have different perception about the online courses. This section is divided into several parts. There are several themes for each part, including form of online courses, elements evaluated and students' perception of online courses.

4.1 Form of Online Courses

Among these studies, most of the studies stated that the university students had the online course during the pandemic of COVID-19. In most of the studies, students do not have the online course before the pandemic of COVID-19. Nevertheless, in the study conducted by Karim (2021), participants of the research were in the course, "Introduction to Environmental Engineering". This course was taught with hybrid of online course and offline course before the pandemic of COVID-19. Students spent 50% time for in-class lecture and 50% time for online self-paced courses. Besides, students did their quizzes and homework online while the midterm and final exams were taken offline before the pandemic of COVID-19. Therefore, students in this course had experiences with online course. But in the pandemic of COVID-19, the courses were delivered online and all the exams were taken online. This was the major change for these students in the pandemic of COVID-19. While, in the study conducted by Di Giacomo and Di Paolo (2021), students in Sapienza University of Rome have been involved. In this university, the video-live lessons and digital platforms had been used for replacing face-to-face offline teaching and learning during the closure of the institution in 2020. Students' perception about online courses can be different in several elements. For instance, Di Giacomo and Di Paolo (2021) found that Hygiene students and Dentistry students have different perception and attitude in several areas, including quality of lessons, promotion of attention, perception of stress and physical fatigue. Due to the course differences, demand of students and

other factors, students in different majors can have some differences in their feelings during the online course.

In other studies, the situation is different. For instance, the participants in Ober and Kochmanska's study (2022), there was no particular discussion about the changes of courses during the pandemic of COVID-19. Instead, the results emphasized the length of remote learning and forms of studies. More than half of the participants in Ober and Kochmanska's study were university students who have around 1 to 2 years of remote learning. This length was related with the pandemic of COVID-19. Nevertheless, this study has focused on the evaluation of online course experience and students' perception of online course. In the study conducted by Hyvärinen and Björkman (2021), the hybrid of online and offline model has been mentioned. During the pandemic, there were some periods for lockdown and some other periods that organizations can be opened. Universities have had the totally online teaching and learning for all these period or the hybrid for the opening periods. Therefore, this study has focused on the students' perception about online courses in different periods. The study conducted by Flores1 et al (2022) has the similar situation.

4.2 Elements for Evaluation

For different studies, the elements used for evaluating online courses experience and students' perception about the online course have some similarity and differences. In the following table, the major elements involved in the questionnaires of different studies were listed.

Table 5 Major Elements in Questionnaire

	Authors	Major Elements in Questionnaire
1	Karim	The factors for investigating students' perception and attitude towards online course can be divided into three sections, including: A. Perception and attitude about the course content and alignment in online synchronous approach B. Perception and attitude about the online assessment process and online closed book exam C. Perceptions and attitude about the test taking options and levels of learning Also, some indexes for measuring students' academic performance level, including final exam scores, weighted average GPA and overall course grade are involved. Some other factors have been involved for evaluating the learning environment of students in their remote learning.
2	Ober and Kochmanska	Altogether 18 items in the questionnaire are divided into four dimension, including: A.The socio-emotional dimension, refers to the items about feeling of isolation, social connection, interaction with lectures and feeling of fatigues related with using of information and communication tools and other items. B.The developmental dimension, refers to the efficiency of knowledge acquisition, learning of how to use information and communication tools and development of digital competencies C.The time and financial dimension, refers to the items of saving time and expense and opportunities of combining work and study D.The dimension of negative attitude, refers to some possible negative perception about online learning and related behaviour with using of internet.
3	Uusiautti, Hyvärinen & Björkman	This study has two sets of questionnaire for students and staffs in universities. Elements listed here are from the questionnaire for students. These elements are about:

		A.Satisfaction with remote learning arrangement B.Needed support and received support C.The sense of communality D.Motivation of remote learning or learning in hybrid form
4	Flores1 et al	Evaluation elements are divided into three sections. These sections are about perception and experience of the condition, the process and the assessment and feedback of online teaching and learning. For different sections, the items are different. These items are: A.Condition: resources and equipment, problems encountered, online tools used for online teaching and learning and adaption process B.Process: student's experience with online learning, strategies and tools they used and preferred format of learning in the future. C.Assessment and feedback: effectiveness of online assessment, most used methods of assessment and feedback received online. Also, there are some open-ended questions involved in the questionnaire for making participants to describe their experiences and perceptions in their own words.
5	Di Giacomo and Di Paolo	Altogether twenty-four questions involved in the questionnaire. These questions are divided into several parts, including: A.Demographic elements of students B.Environment and suitability of the online platform C.Impact of online learning on mental and physical sphere D.Comparison between online and offline courses E.Students' perception and satisfaction

		F.Suggestions for remote learning and positive and negative factors involved in remote learning.

From these elements, it is found that different studies have focused on different areas for evaluating the online courses and investigating the perception of students. Nevertheless, some similarities of these items are settled in these studies. For instance, in these studies, the perception of students have been investigated through some factors, such as their satisfaction with the online course and their experience with online course. Some studies have divided the satisfaction and experience into different elements, such as their perception about content, process and other elements in online course. Also, the evaluation covered the factors about socio-emotional elements, financial elements and other elements which can impact on behaviour of students. Because of these elements, students can have different attitudes towards online course. For those students who care more about the financial element might prefer online courses. The negative perception can be about the experience they have in online course and their performance. The areas which made students unsatisfied are the direction for the improvement of online course.

4.3 Students' Perception of Online Courses

Based on the findings of these articles, students' perception of online courses was impacted by their experiences. Besides, some characteristics of remote learning can impact on students' perception, such as lacking of social connection and interaction. The results of these studies are listed in the following table. The results involved the positive and negative perception of students about remote learning. Elements which can impact on the experience of students in remote learning will also be listed in the table.

Table 6 Perception of Students and Elements to impact on remote learning outcome

	Authors	Perception of Students	Elements to impact on remote learning outcome
1	Karim	The result of this study is concluded as followed: A. Students' perception and attitude about the course content and the alignment do not have any difference before and after the COVID-19. B. Due to students' computer and their knowledge of using computer, some of the students did not accept the online exam with lockdown browser and webcam well. C. Students did not accept the online close book exam because of the webcam. Students' academic performance was not degraded by online approach.	The elements which impact on students' perception of online course are their knowledge of using computer and information and communication tools. Also, their psychological experience with online exam under webcam have negative impact on their perception of online approach.
2	Ober and Kochmanska	The overall perception of students about online course is positive. In different periods, students have different forms of online course. In a certain period, students have the hybrid form of online and offline course. Nevertheless, students prefer online course because it can provide more flexibility for them to acquire the knowledge at their own pace. Social isolation and the fear of poor preparation of online courses are the major negative perception about online course. Gender differences can also be found in the evaluation of online course. Women pay more attention on the development dimension and financial and time dimension. Besides, one of the significant finding is that students with longer tine of remote	There are different elements which have positive or negative impact on students' perception of online courses. The positive elements involve: A. Flexibility of online course, such as flexible study time and flexible pace based on individual's need. B. Developmental elements, such as quick acquisition of knowledge, opportunity to learn information and communication tools and other digital skills.

		learning have a better evaluation of online course. With longer time, they know better about how to deal with some disadvantages of online course, such as the using of information and communication tools.	C. Financial and time saving benefits The negative elements involve: A. Social connection elements, such as feeling of isolation and lacking of social connection. B. Poor knowledge of using information and communication tools and remote class C. Environmental distraction D. Lecturer's capacity and preparation of remote teaching E. Fear of change and fear of internet addiction
3	Uusiautti, Hyvärinen & Björkman	The overall perception about online course is positive. Nevertheless, some dimensions of the perception are impacted by the students' experience in the university. For instance, the new students did not have enough interaction with their peers or being familiar with the lecture arrangement in universities. In this circumstance, they had a lower satisfaction in the sense of communality. In other section, when students are familiar with the course in the university and the arrangement of online course, they	From the research result, it is stated that the major element to impact on students' perception is their length of stay in the university and their experience with online course.

		have a better perception.	
4	Flores1 et al	Students with previous online course experience have a more positive perception and adaptation. Besides, if their experience with online teaching and learning is positive, they are more easily to be motivated and satisfied. Their satisfaction with online course can be improved and the negative emotional feelings, such as fear/ anxiety, tiredness and stress can be reduced. On the other hand, students who have no prior experience with online course have more negative perception.	Experience and prior experience of students decide their perception of online course. Also, role of teachers impacts on the perception of students significantly. Teachers' support can help students to adapt online course.
5	Di Giacomo and Di Paolo	The overall satisfaction level of the online course among different groups of students is not high. Students in Oral Hygiene major have the satisfaction level lower than the average level while students in Dentistry have the average satisfaction level. The results showed that students have the positive perception if they have comfortable environment for distance-learning. The physical environment and the online system for remote learning impact on the comfortableness of environment. However, due to the features of the course in this study, students need more case-based learning. Thus, they need the university to adjust the online course design and have more flipper class for supporting their study. The positive perception of the online course is also related with the flexibility of this teaching and learning approach. Students can acquire knowledge at their own pace.	In this case, due to the features of students' major in this study, the demand of students for course design and the practice are different from other studies. Therefore, professor's readiness for online course and their course design or strategy for teaching and learning impact on students' perception. Moreover, advantages of online course in this case are similar with other cases. But the overall satisfaction of students in this case is not high because of the knowledge development related with the case-based learning.

		However, lacking of social interaction and the face-to-face lecture made students have lower satisfaction with the course. Professors' readiness for the online courses also impacts on the perception and satisfaction of students in online course.	

From the comparison of these findings, it is found that the overall perception about online course is related with students' experience in the university. New students who do not have social connection in the university have a more negative perception with social and emotional dimension. Besides, the experience with online course has certain impact on the perception. Students who have experience with online courses before have a better acceptance during the pandemic of COVID-19. Their positive perception is related with their skills of using information and communication tool and their confidence of the online course design.

However, in the study conducted by Di Giacomo and Di Paolo (2021), students need more opportunities for offline practice. In this circumstance, they did not accept well online course because the online teaching and learning approach provide them the opportunities for case-based practice. Students in other studies have a more positive perception about online course. These perceptions are related with different advantages of online courses. In these studies, it is found that some universities have hybrid approach before the pandemic of COVID-19. In the lockdown period, these universities had the online approach only. But in the post-COVID-19 period, universities have the hybrid approach again or turn to offline lectures. From the research, it is stated that teachers' support and their course design can impact on students' perception and experience with online course.

4.4 Synthesis

In conclusion, it is found that university students who have online course experience before can accept online teaching and learning during the pandemic of COVID-19. Their skills and the acceptance of online course make their experience to be more positive. Besides, students need the support from teachers for having a better experience with online course. Therefore, the course design and other strategies used for online courses should be considered by teachers. For making students to accept online courses, teachers should know how to design the interaction and the content of the courses.

5. Discussion

In this chapter, the research questions will be answered based on the documentary analysis. Through the comparison results and analysis results of the documentary analysis, issues which are used for answering the research questions were collected. This chapter will be divided into several parts based on the research questions, including acceptance of online course among students, changes of students' perceptions and changes and improvement of online courses.

5.1 Acceptance of Online Course among Students

According to the analysis result of different articles about students' perception of online courses during and after COVID-19, it is stated that students' acceptance of online courses was impacted by many different factors. Students with different previous experience with online course and different majors can have different perceptions of online courses. Some of the participants in these studies have had remote learning before. Therefore, they knew how to deal with the information technology for online course. But students who did not have such experience did not know how to use the information technologies (Khan, et al., 2020). Because of this, students who have previous experience with remote learning accept better the online course. During the pandemic of COVID-19, students had to stay at home for months and they needed to have online course for continuing their learning. Because of this, students have to learn information technology for online courses. Information technology helps them to accept this teaching and learning approach.

Among the students in these articles, some of them are in the medical major. Because of this, these students preferred offline course because it offers them more opportunities for practicing. One shortage of online course is that this approach is lacking of communication and social interaction with different participants in the course. For students in some majors, especially the medical students, offline practice and face-to-face interaction are important (Bączek, et al., 2021). With this demand, these students will not accept the total online teaching and learning approach after the pandemic.

From the articles, it can be found that there are some advantages and disadvantages of online courses. These advantages and disadvantages decide student's acceptance of online courses. For

instance, online courses have some financial benefits, such as saving commuting time and cost. Besides, online courses allow students to learn at their own pace. Students can repeat the course video and have a better understanding about the contents of the courses. However, in online course, they did not have the chance to practice their skills of operation or other skills which need the offline interaction. Because of this, these students who need the offline practice did not accept online course well. Perception of students towards online courses is decided by many factors. Their skills and knowledge about the online course and their need in learning impact on their perception.

During the pandemic of COVID-19, students have to learn the technology for online course. Therefore, they know better about what they should do for have the smooth learning process. With the knowledge of the information technology, these students can have a better acceptance of the online course. Besides, they have noticed the advantages of online courses, such as the flexibility and the saving of time and cost. With these advantages and the knowledge of using the information technology for online courses, they are more willing to accept online course. Nevertheless, they also need the offline practice and interaction with their peers and the professors.

5.2 Change of Students' Perception of Online Courses

As stated in these articles, students' perception did not change after the pandemic of COVID-19. Fortunately, the overall situation of students' perception after the pandemic of COVID-19 is positive. Students who have the hybrid approach before the pandemic of COVID-19 did not change their perception. Students who are in the major of Dentistry and Oral Hygiene do not have the positive perception of online course after COVID-19. They did not like online courses because it was lacking of the practice and the interaction with others. Other students have the positive change in their perception of online courses. With the development of their skills in information technology and their understanding of the advantages in online course, they can have a better perception of this teaching and learning approach.

Based on the articles and the results of these researches, the changes of students' perception can be related with the advantages they found during the pandemic of COVID-19. In different articles, the

research results about the advantage of online courses are the same. Flexibility in time and location, financial benefits, allowing students to combine work and study and other benefits of online courses can make some students to accept this approach better. But some other students do not have the positive perception of online courses because of the disadvantages. Lacking of social tie and lacking of offline practice are the major disadvantages. Moreover, the course design and strategies for teaching impact on students' perception. Beyond the vested benefits of online course related with the advantages of information technology, universities should pay much attention to the course design and other strategies which help students to acquire the knowledge (Gopal, Singh & Aggarwal, 2021). Besides, the self-regulatory of students can impact on their academic performance in online courses. These factors should be considered by universities.

The research result shows that experience of students and outcome of the online learning impact on students' perception of online courses. During the pandemic of COVID-19, students were forced to get used of online courses even they did not have such teaching and learning approach before. The uncomfortable feeling is rooted in many different issues, such as the noise environment at home, lacking of social interaction, unfamiliarity with information technology and the practice in online course. The changes of students' perception are related with these elements. For instance, knowing how to use information technology for online course and getting more familiar with the online teaching and learning approach can make students have a more positive perception (Wei & Chou, 2020). Universities should consider about these elements and make suitable strategies for motivating students and giving them a better experience with online courses. According to Mandasari (2020), there are some elements relate with positive online learning experience and academic performance. These elements are flexibility, accessibility and learning autonomy. Also, good online learning experience can motivate students' learning behaviour and help them to improve their performance. These elements are the keys for universities to make strategy and design online course.

In the online course design, universities and professors should work on the engagement of students. As stated, students have less interaction with professors on online courses. If they cannot use the information technology well, they were not able to communicate with their teachers on time in online courses. Thus, making suitable course design and necessary training for students to be familiar with

information technology are necessary for improving students' experience and their performance (Rajabalee & Santally, 2021).

Self-regulatory behaviour has also been considered as an important factor for students' academic performance in online courses. However, in online courses, note-taking behaviour and other learning behaviour cannot be checked by tutors on time if the online course cannot have the suitable supportive system (Nakayama, Mutsuura & Yamamoto, 2021). Lacking of interaction between students and teachers leads to the situation that teachers in online course cannot notice whether students have focused on the course or not. This situation makes the self-regulatory behaviour to be more important in this approach. Because of these elements, universities and professors need to think about what they should do with online courses and how to combine online approach and offline approach for achieving the best outcome. During the pandemic of COVID-19, large scale data has been collected for analyzing the possibility of online courses. Results from data analysis show the changes and the further directions for online teaching and learning development.

5.3 Changes and Improvement of Online Courses during COVID-19

Before lockdown period in COVID-19, online course was not a common approach for universities for their full-time students. However, during the pandemic, almost all the universities had to turn to online platforms. Students' experience with online courses and their perceptions of online courses have been changed. At the beginning, universities did not know what they should prepare for online courses. But after the pandemic, universities and professors have gotten some experiences about how to motivate students and involve students into the interaction. During the lockdown period, students had also experienced the advantages of online courses. Although they still had some problems with the practice of online courses and the social-emotional issues, they accessed a positive perception. After the COVID-19, universities have noticed the elements they can improve for a better performance of online courses.

First of all, the flipper class is the new approach for the online courses in universities (Hao, 2021). With flipper class, the interaction between students and teachers is changed. Students can play a

more active role in the class. Instead of making them listen to the teachers and taking notes, flipper class requires students to prepare their own materials and some activities for helping them to acquire the knowledge. Secondly, universities have noticed the importance of teaching material access and the using of online course platforms. As stated, the knowledge of information technology for online course can impact on students' experience and their perception. Besides, the accessibility can impact on students' performance. These elements decide whether students accept this approach better or not. Therefore, universities need to consider about how to make students get familiar with online course platform and how to enrich online teaching resources. Fortunately, with the development of information technology, universities have digitized learning materials for the remote learning (Arthur-Nyarko, Agyei & Armah, 2020). However, there still have a lot of challenges for different majors. Lastly, through the practice of online courses during COVID-19, teachers have more experience with online courses. The advantages of online courses have been discovered. In some studies, online courses can also help students in universities to have a better performance. Thus, universities have the course design which combine online courses and offline activities for improving the experience of students and improve their performance. All these strategies can be the changes and improvement of online courses in universities through analyzing the experience in COVID-19. With the development of information technology and the change of people's life style, online course will be more common in the future. Thus, to find the suitable strategies for improving the effect of this teaching and learning approach.

5.4 Synthesis

The practices of online courses in COVID-19 had set some challenges to universities and students in the past. Students and teachers were not familiar with this learning and teaching approach at that time. Therefore, they did not have a good experience or perception of online courses. With the practice of online courses in universities all over the world, influential factors, students' perception and strategies which can improve the outcome of online courses have been concluded. These experiences help universities to figure out what should be done for improving the performance of online courses and how to make students to have a better experience with online courses.

6. Conclusion and Recommendation

6.1 Conclusion and Limitation

In conclusion, this study used secondary data from studies about university students' perception about online courses before and after the pandemic of COVID-19. Online teaching and learning approach are the trend for the future. In the pandemic of COVID-19, these are lots of challenges for universities for designing online courses and for arranging the suitable combination of different learning and teaching approaches, such as teachers' support online and the effective interaction between different participants. Students were more familiar with information technology used for online study platforms after COVID-19 pandemic. Although students in dentistry and oral hygiene did not accept online leading well, other students show a more positive attitude and perception. It is stated that students who need more offline practices did not like online courses. However, from the studies, it finds that students have a higher level of acceptance after they know how to use information technology for online courses. They also know the advantages of online courses during this period. Flexibility can be the major advantage of online courses in students' perception. Nevertheless, there are some other limitations of online courses, such as lacking of teachers' support, requirement of self-regulatory and other problems. When students get used of the online course model and have a better self-regulatory behaviour, they also get a good performance in their study. Furthermore, universities and professors need to know better about students' feedback and their demand in online courses. Also, they need to think about how to overcome the challenges of online courses, such as the weak interaction between students and teachers and the high requirement of self-regulatory. New strategies and new course design should be introduced based on students' feedback and perception during COVID-19. It is stated that practice in COVID-19 has offered a lot of cases and experience to universities for further improvement in this approach. However, the improvement of course design and the adjustment of teachers' behaviour and students' activities have not been investigated in this study. Whether students' perception has been impacted by these changes cannot be identified. Based on the research design of this study, there are some limitations should be noticed.

This study has investigated universities in European countries. The educational resources and the internet facility accessibility in these countries are in a better position. Therefore, the problems exist in these cases were not serious and students can solve these problems easily. However, in other countries, such as some developing countries, the situation can be quite different and students' perceptions about online courses are not the same. Students' perception, advantage and disadvantage of online courses and their experience are similar in the selected studies. Students' skills with information technology can impact on their learning in online course. Thus, universities should investigate how to upgrade students' skills in information and communication tool using and other issues. Universities should also consider about how to digitize learning and teaching materials and how to arrange different types of resources for supporting this approach. Besides, the solutions for improving the self-regulatory of students should be investigated. Based on these findings and statements, the direction for universities to have a better practice in online teaching and learning for full-time students can be identified.

6.2 Recommendation

6.2.1 Recommendation for Online Courses

Based on the findings of this study, it is stated that universities should have some changes in the teaching and learning model for fitting the changes brought by online courses. Findings from different studies have shown that there are some problems need to be fixed by universities. The recommendations for online courses are made based on these problems. The recommendations are about the course design, students' behaviour modification in online course and possible hybrid of online approach and offline approach.

As stated in the discussion, flipper class has been involved in the online course model. For improving the interaction between teachers and students and attract the attend of students in online teaching and learning process, teachers should change some traditional teaching and learning activities in the offline classes. Now models and the information technology should be used for ensuring students focus on the contents of the class. Besides, flipper class can make students to be engaged in the teaching and learning activities better. Also, design of other elements in online courses should be

improved for solving some interaction problems and improving students' experience. Self-regulatory behaviour of students has been considered important in the past. However, this kind of requirement is not be suitable if the online courses are taken by all the full-time students. Instead of requiring students to be self-regulated, universities should find the solution for supporting students' study and modifying certain behaviour for helping them to improve their efficiency.

The hybrid of online approach and offline approach should be considered. With hybrid, advantages of both approaches are involved. Students can have more offline practice and social interaction with others. Besides, the flexibility and the financial and time cost saving are guaranteed. When universities are design the curriculum, the hybrid approach and the related resources should be considered. Furthermore, universities should pay more attention to the teaching material digitization and the necessary training for helping teachers and students to access online courses and online resources. As online teaching and learning are the trend for the future, universities should get ready for this future. Also, universities should help teachers and students to have the readiness for online study.

6.2.2 Recommendation for Further Study

Limitations of this study can be the base of the recommendation for further studies. For example, in this study, all the participants are from European universities. It leads to the the unity of participants. In further studies, variety of cases should be enriched for guaranteeing the diversity of participants. Further studies should involve universities from different areas. The comparison of students in different areas and their perception can show more problems in the adoption of online course. Moreover, the resources of universities in online learning should be investigated for finding the differences and the impact on students' perception. With this kind of research, the problems exist in online course and the solution for these problems can be identified. Different countries have different problems and situations. Therefore, more cases from different areas show these differences and make an in-depth analysis about what resources are needed for improving the online course performance.

Furthermore, in further studies, primary research should be considered for getting more specific information about the online resources in universities and opinions about different participants. Observation should be considered for getting certain information about universities' online course and their digitization of teaching materials. Also, questionniare and interview are needed for collecting information from students and teachers in different universities. With the interview and questionnaire among students in different areas, more in-depth primary data is collected. Primary data from observation, interview and questionnaire help the researchers to compare the differences between these areas and know better about what should be done in different areas. With this kind of research, the recommendation for universities in different countries with differences resources can be made. For instance, through the comparison of online resources in different unviersitie and the perception of students and teachers in these universties, the factors for improvement in online course can be identified. Relationship between students' perception and factors of online courses and digital materials in universities is expected to be identified. This relationship can help universities to figure out their shortage in online course implementation. Besides, through this kind of research, recommendations for universities to design the suitable approach for online courses can be made. The recommendation can be more targeted and helpful for universities in various conditions.

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