Merve Nur Köroğlu[1]
Master Student, Erciyes University
Türkiye
Assist. Prof. Dr. Esra Kızılay[2]
Erciyes University, Faculty of Education
Türkiye
Prof. Dr. Emine Güneri[3]
Erciyes University, Faculty of Education
Türkiye

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A META-SYNTHESIS STUDY FOR STUDIES ADOPTING THE QUANTUM LEARNING MODEL

Abstract: The aim of this study is to examine the different aspects of national articles and postgraduate theses on the quantum learning model conducted in Turkiye between 2010-2021. This study is a study conducted with content analysis and includes research on the quantum learning model, which can be accessed from the TR index and YOK Thesis Center databases. The data were analyzed in reference to the type of publication, year of publication, research model, research design, sample group, number of samples, data collection tools, data analysis method, and study subject. The results of the analyzed studies are indicated with graphs and tables. It is thought that this study will provide a general perspective to researchers who will study the quantum learning model.

Keywords: Quantum learning model, meta-synthesis, education.

Introduction

Education is the process of acculturation of the individual towards creating desired behavior. This process is carried out in schools with formal education. While performing the teaching process, teachers take various teaching models as a guide to provide effective teaching to students (Senemoglu, 2015: 92). Instructional models shape curricula and form instructional materials. They also assist the teacher in the classroom or in other circumstances. While some of the teaching models are individual teaching models, some others are group teaching models (Joyce & Weil, 1980). Examples of group teaching models are Carroll's model of learning at school Seel (2012), Bloom's mastery learning model Guskey (2010), Slavin's effective teaching model-QAIT (Riau, 2010). Examples of individual learning models are programmed learning, Hoskova-Mayerova & Rosicka (2012) computer-assisted instruction Blok et al. (2002), personalized systems of instruction Hursh (1976), and quantum learning model (Senemoglu, 2015).

The quantum learning model (QLM), one of the contemporary learning models based on quantum physics, was developed by Bobbi DePorter. QLM covers the key concepts of many methods and techniques such as suggestopedia Jayanto, & Rintayati (2017), accelerated learning techniques

[1] mn.koroglu.mn@gmail.com
[2] eguven@erciyes.edu.tr
[3] emineg7@gmail.com

Kusuma & Pramesti (2020), NLP De Porter & Hernacki (2000), right-left brain theory, triple brain theory, learning styles (visual, auditory, kinesthetic), multiple intelligence theory, holistic education, experiential learning, metaphorical learning, simulation, and emotional intelligence (Bakir, 2017; DePorter & Hernacki, 1992). QLM is a teaching model that aims at both the individual's multi-faceted development and self-realization (Cagli, 2019; Hanbay, 2009; Sujatmika, 2018). The quantum learning cycle consists of Enroll, Experience, Label, Demonstrate, Review and Celebrate stages. Each stage reveals the relationship between part and whole in both learning and teaching processes. Based on this, it ensures that learners are interested and curious in every lesson (DePorter & Hernacki, 1992). With the quantum learning model, learners can gain different features like the ability to evaluate the subject from different aspects, problem-solving skills, analysis skills, critical thinking skills, and creativity (Amin et al., 2021; Ramadhani & Ayriza, 2019).

QLM prioritizes visual, auditory, and kinesthetic intelligence. At the same time, aiming to create the right working environment, QLM ensures that this environment is pleasant, comfortable, and facilitates learning. The fact that students feel comfortable, pleasant and dynamism in this learning environment will also contribute to the realization of learning by opening their perceptions of the lesson (Khozaei, 2022; Sujatmika, Hasanah, & ve Hakim, 2018). It strengthens the relationship between students and teachers in a positive sense and thus decisively affects the perspectives of students by increasing their interest in the lesson (Suryani, 2013).

QLM contributes to the development of students' creativity and memory while it can be developed their critical thinking (Akihary and Apituley, 2022; Sujatmika, Hasanah, & ve Hakim 2018). It contributes to students having aesthetic and original ideas (Eriyanto, Inganah, & Utomo, 2019). Thus, lifelong learning is ensured in individuals, and the knowledge becomes permanent (Ilhan, Gulersoy, & Gulersoy, 2017). Through the eight keys of excellence presented below, QLM provides individuals with the ability to manage their emotions and thoughts while enabling them to gain different perspectives (DePorter & Hernacki, 1992).

1. Be Holistic: It emphasizes that the thoughts and behaviors of the individual should be compatible and includes concrete situations. For example, a student with a physical illness may have little interest in the lesson. With a holistic approach, students become healthy young people in every sense with a broader perspective and life skills (Gullu, 2010; Ng., 2020).
2. Mistakes Bring Success: Many individuals are unable to put their thoughts into action because of the fear of making mistakes. However, mistakes often guide us. Actually, there are no errors, only results, and feedback (Chialvo & Bak, 1999; Yilgen, 2014).
3. Speak with a Good Purpose: The thoughts turn into actions after a while. In line with this principle, it is important to think positively and speak with positive emotions. Because speaking in line with a good purpose and in a positive way affects the motivation of the individual in good way (Naseem & Khalid, 2010; Yilgen, 2014).
4. Focus on Your Goal: It includes the principle of committing yourself to what you are doing and doing your best. The individual should do his job by paying attention and showing the highest performance to his job (Ay, 2010).
5. Dedicate Yourself to Your Ideal: The life quality of people who set goals will increase. If - individuals determine their goals, believe in them completely, and always visualize them in their minds, they will definitely reach their goals (Ay, 2010; Irtelli, Durbano, & Marchesi, 2021).
6. Take Ownership of Your Job: It is important that the individual does not hesitate to take responsibility and is aware of his/her own behaviors, and responsible for these behaviors. The meaning of responsibility is to embrace both success and failure (Conley and French, 2014; Gullu, 2010; Gurel, 2017; Unal, 2019).
7. Flexibility: In order to achieve the desired results, the individual should be open to new

ideas, and the targets should be determined in accordance with the purpose. The individual should know that success is often the product of flexible thoughts (Candra et al., 2022; YalCintas, 2019).

8. Balance: It includes the principle of being in the balance of intelligence, body, and spirit. Time must be spent on developing a balance. A quality life is a state of being in the balance of body, soul, and mind (Bakir 2017; Cakir 2013). With the developing and changing age, teaching methods and models are also changing. Despite the widespread use of QLM, which aims at the self-development of the individual in all aspects (Sujatmika, Hasanah, & ve Hakim, 2018).

There are studies in the literature (Mantra, Handayani, & Suwandi, 2020; Kristiyanto, 2019; Kusuma & Pramesti, 2020; Utari, Utomo, & Zukhrufurrohmah, 2020; Zaroha, 2019). However, the limited number of studies in the literature necessitated the creation of this study (Guler & Yazici, 2018). Although there are many studies in the literature on the quantum learning model, the difference in the current study is that it allows readers to have information about the studies that have been done before. This study is a meta-synthesis study. Therefore, it includes the study of studies on the quantum learning model in many ways. Thus, it will provide readers with an overview of the quantum learning model from many sides.

In line with this need, it was aimed to investigate the studies on QLM in Turkiye conducted between the years 2010-2021 and to examine them within the subject headings determined by the researchers (type of publication, year of publication, research method, number of samples and sample group, research topic, data analysis). It has been determined that the examined studies act with the understanding of the eight keys of excellence of QLM. In these studies, it is aimed to develop individuals in a versatile way, provide individuals with different perspectives, enable them to gain experience from the mistakes made, set goals, and take firm and right steps in line with these goals (Amin et al., 2021; Ariftian & Madjdi, 2021; Cagli & Sivaci, 2020; Fuchs & Tan, 2022; Kanadli, Unal, & Karakus, 2015; Kusuma, Gunarhadi, & Riyadi 2018; Pratama & Solehuddin, 2018; Rustam, Murdana, & Usman, 2022; Zhang, 2022).

It will be ensured that more useful and productive individuals are brought into society by being heard of a teaching model that cares about the development of individuals in all aspects. Considering the efficiency and effectiveness of QLM, this teaching model should be implemented more frequently by researchers and teachers and become more widespread. To achieve this aim, the present study has been carried out. This study includes an overview of the studies on QLM in the last eleven years in Turkiye. While the current study gives general information about QML to the readers, it is expected to inspire their future studies. It is thought that through the meta-synthesis study, a general perspective will be gained on the studies related to QLM in the literature. In this context, both theses and article studies between the years 2010-2021 were examined to find answers to the following questions. What is the distribution according to publication types (article/thesis)?

1. How is the distribution according to years (2010-2021)?
2. How is the distribution according to the research model?
3. What is the distribution according to the research design?
4. How is the distribution according to the sample group?
5. How is the distribution according to the number of samples?
6. What is the distribution according to data collection tools?
7. How is the distribution according to the data analysis method?
8. How is the distribution according to the study subject?

Method

Research Model

Meta-synthesis, which is one of the qualitative research patterns, was used in this study. Meta-synthesis is a type of study included in content analysis studies, and it is the interpretation and synthesis of studies on the same subject with a critical perspective by creating themes or main templates (Calik & Sozbilir, 2014; Strobel & Van Barneveld, 2009). It can be said that detailed examinations of several studies can be made through this design (DinCer, 2018).

Meta-synthesis study is the analytical interpretation of the findings in line with the data obtained. In this direction, it provides to shed light on new studies to be done (Aspfors & Fransson, 2015).

In the current study, the studies developed on QLM were examined using the study form created by the researchers. In this respect, National articles and theses written between 2010-2021 about QLM were analyzed and synthesized in terms of publication type, publication year, research model, research design, sample group, number of samples, data collection tools, data analysis, and study subject.

Data Collection Process

The TR index and YOK Thesis Center articles and theses on QLM were investigated in this study. In the research, a search was conducted with the keyword "quantum learning", on the condition that it covers the years 2010-2021. According to the data obtained, a total of 33 results, including 13 articles and 20 theses, were obtained. It has been determined that 29 of these studies are about the QLM with educational science content. This study is limited to the studies reviewed.

Research with content analysis includes material analyzes of the intended studies. In this study, content analysis was used to examine the theses and articles made using QLM between the years 2010-2021. Content analysis is a qualitative research method used to systematically analyze the content of written documents (Wach & Ward, 2013). Examined theses and articles were analyzed according to the Study Classification Form prepared by the researchers The form included study code, authors, study name, study type, study year, research model, research design, study group, number of samples, data collection tool, data analysis method, data analysis program, the research method.

Analysis of Data

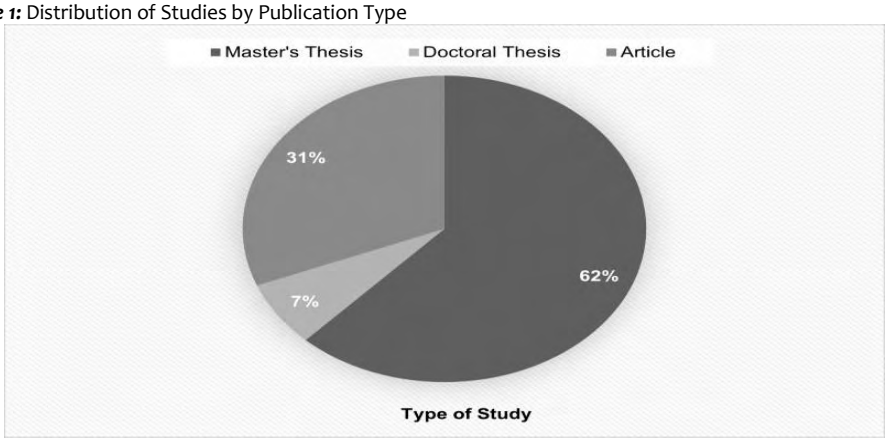
The data obtained in this study were analyzed with content analysis, which is one of the data analysis methods in qualitative research. The main purpose of content analysis is to synthesize the data obtained and to establish the necessary connections. Content analysis is a qualitative research method used to systematically analyze the content of written documents (Kiral, 2020; Labuschagne, 2003). In this study, 29 studies were examined, and the data were entered into the EXCEL program. The data in these theses and articles were coded in terms of the study type, the study year, the research model, the research design, the study group, the number of samples, the data collection tools, the data analysis, the study subject, and academic success. After the data codes were analyzed, they were shown in detail using figures and tables.

Results

Distribution of studies by publication type

Distribution of the studies according to the type of publication is given in Figure 1. According to Figure 1 below, while the most common study is a postgraduate thesis (62%), the least is a doctoral thesis (7%). It has also been determined that the number of articles on QLM made in Turkiye between the years 2010-2021 is fewer than the postgraduate thesis.

Figure 1: Distribution of Studies by Publication Type



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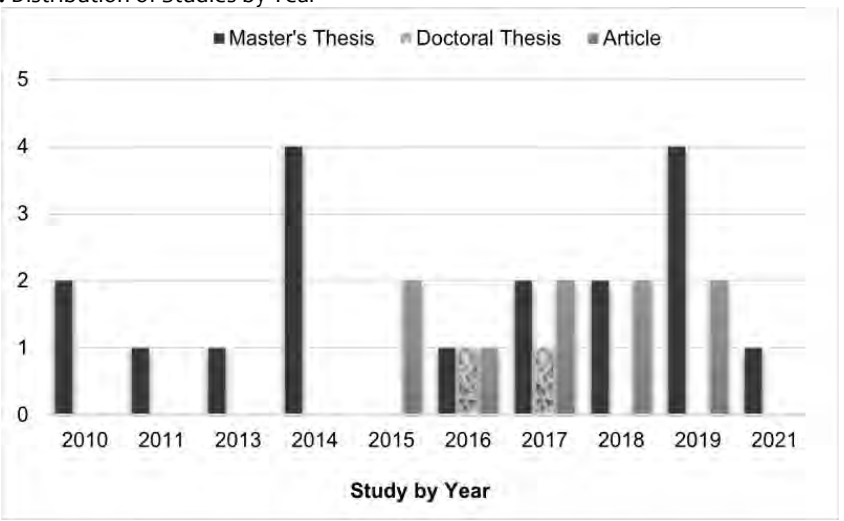
Distribution of Studies by Year

Distribution of the studies depending on the type of publication is given in Figure 2.

Figure 2: Distribution of Studies by Year

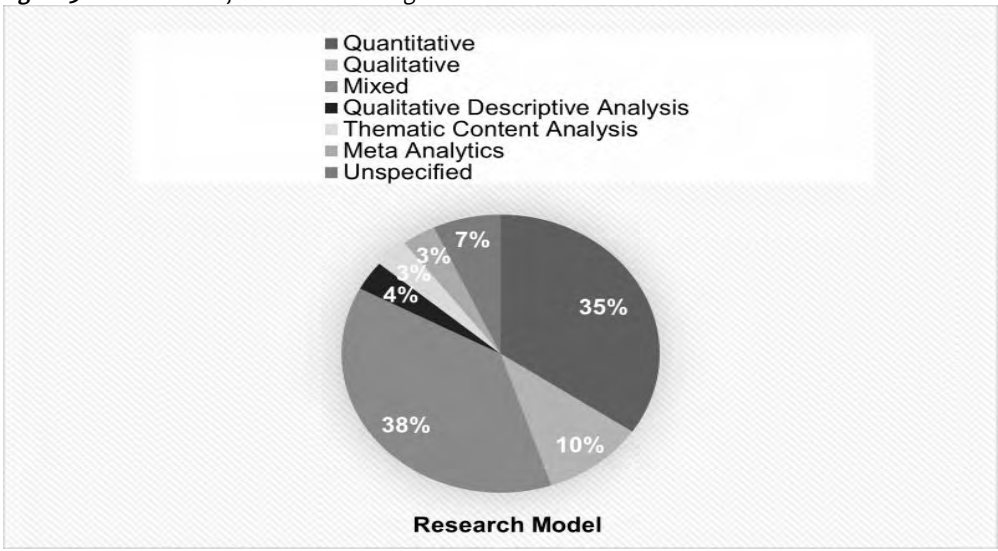


According to Figure 2, the highest number of studies on QLM between 2010-2021 were conducted in 2019. It can be seen that a total of six studies, two of which are articles and four of which are master's thesis, were conducted, while no doctoral thesis was conducted this year. However, there were no articles from 2010 to 2014; it was found that only master's theses were conducted between these years.

Distribution of Studies According to Research Model

Distribution of the studies according to research model is given in Figure 3.

Figure 3: *Distribution of Studies According to Research Model*

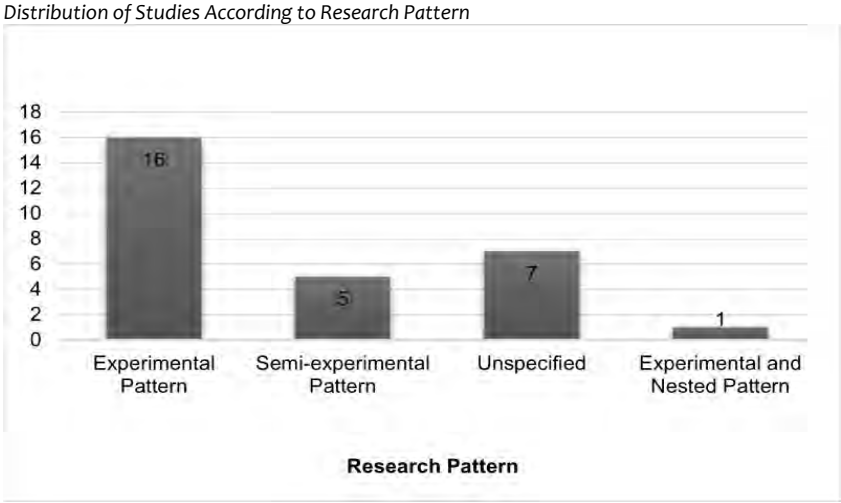


According to Figure 3, it is observed that mixed and quantitative research models are used in most of the studies, and the least used research model is thematic content analysis and qualitative descriptive analysis. In the studies conducted on QLM between 2010 and 2021, 10 were conducted with quantitative model, 11 were conducted with mixed model, three were conducted with qualitative model, one was conducted with thematic content analysis model, one was conducted with meta-analytical model, and one was conducted with qualitative descriptive analysis model. In two of the other studies, the model of the study was not specified.

Distribution of the Studies According to - Research Pattern

Distribution of the studies according to the research pattern is given in Figure 4.

Figure 4: *Distribution of Studies According to Research Pattern*

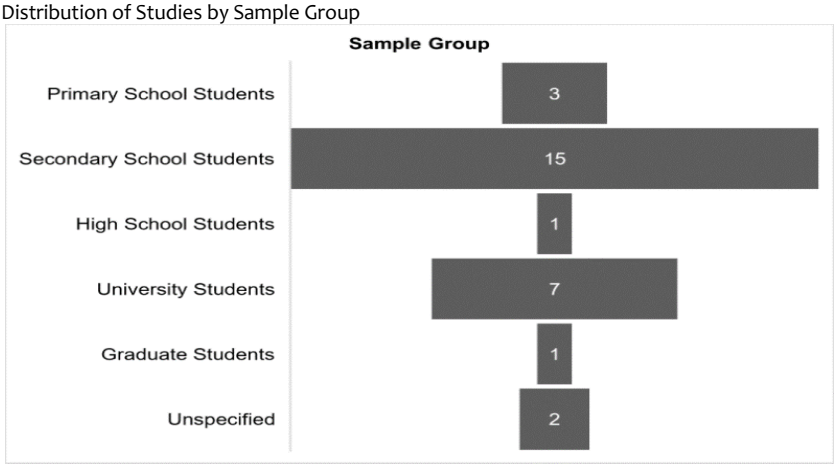


According to Figure 4, experimental design was the most used - research design in the studies. Since it is known that the quasi-experimental design is also included in the experimental design, we can say that 21 studies out of 29 are experimental. In this case, the least used research design was the nested design.

Distribution of Studies by Sample Group

The distribution of the studies according to the sample group is given in Figure 5.

Figure 5: Distribution of Studies by Sample Group

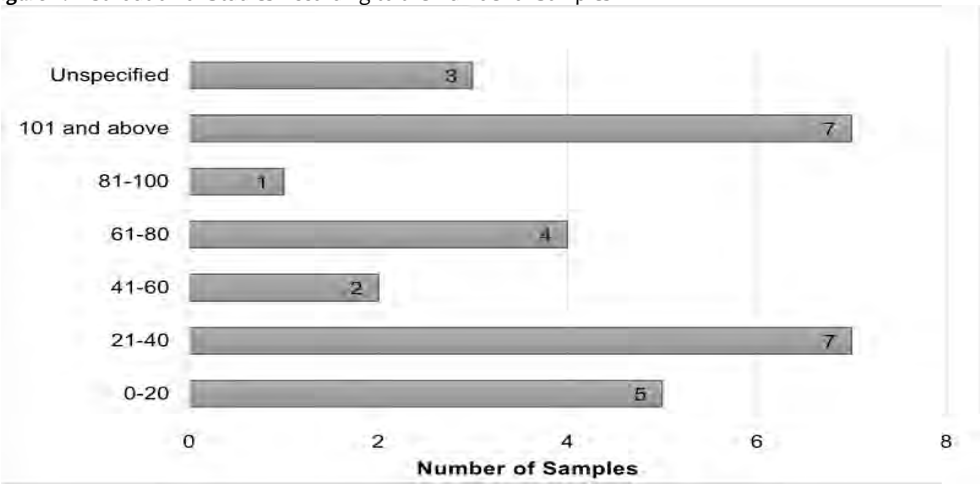


According to Figure 5, most of the studies were focused on secondary school students while the least studied group was high school students and graduate students. When the studies on QLM were examined by grade level, it was observed that three studies were conducted with primary school students, 15 studies were conducted with secondary school students, one study was conducted with high school students, seven studies were conducted with university students, and one study was conducted with graduate students. The class level of the sample of the two studies was not specified.

Distribution of the Studies According to the Number of Samples

Distribution of the studies according to the number of samples is given in Figure 6.

Figure 6: Distribution of Studies According to the Number of Samples

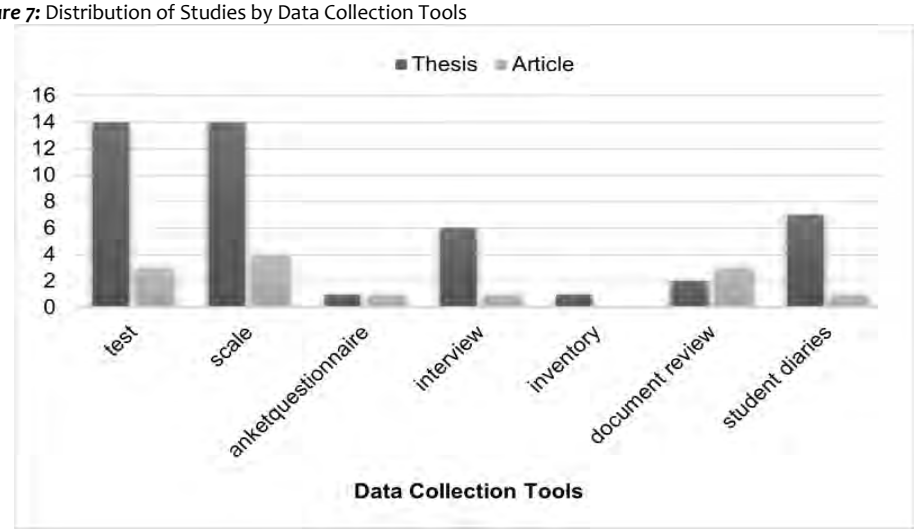


According to Figure 6, the sample size in studies is mostly between 21-40 people or 101 people and more.

Distribution of the studies by Data Collection Tools

Distribution of the studies according to the data collection tools is given in Figure 7.

Figure 7: Distribution of Studies by Data Collection Tools

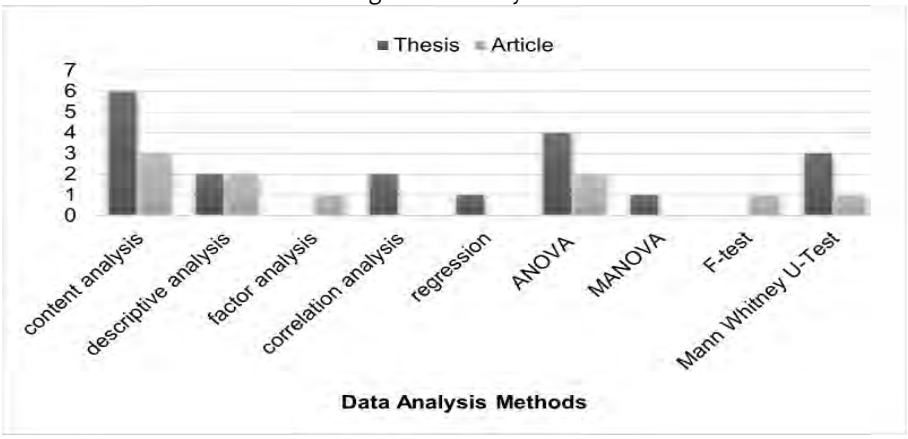


In the studies conducted shown in Figure 7, it was seen that the most preferred data collection tools were test and scale. Test and scale were mostly used in thesis studies. In the studies, it was concluded that the least preferred data collection tools were questionnaires and inventory.

Distribution of Studies According to Data Analysis Method

Distribution of the studies according to the data analysis method is given in Figure 8.

Figure 8: Distribution of Studies According to Data Analysis

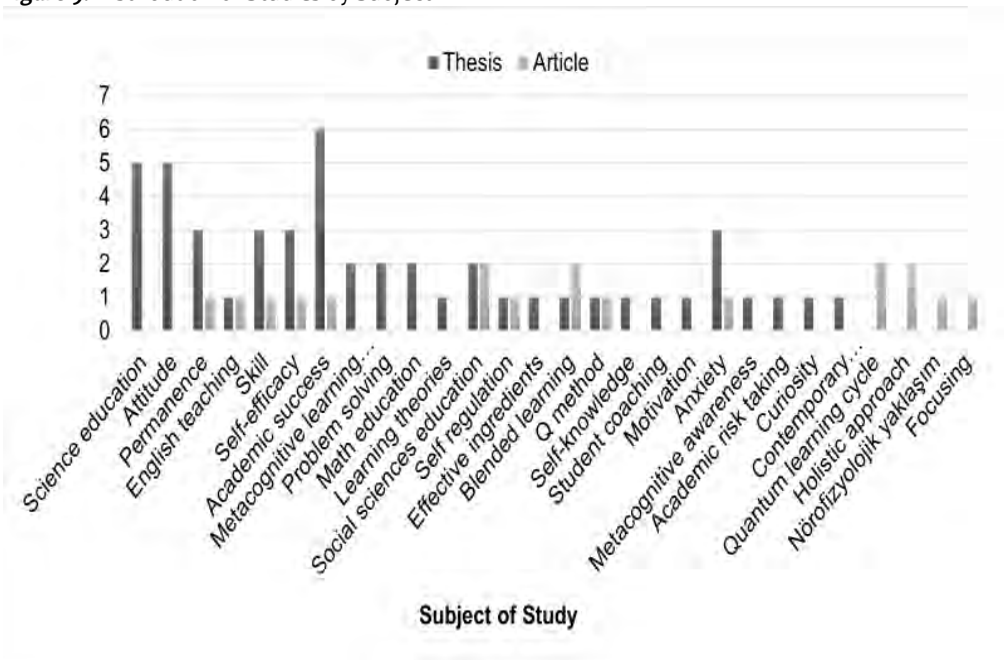


According to Figure 8, it can be seen that content analysis is mostly used in data analysis in theses and articles. After the content analysis, ANOVA was mostly used in the theses examined, while descriptive analysis method is mostly preferred after content analysis in the articles examined.

Distribution of Studies by Subject

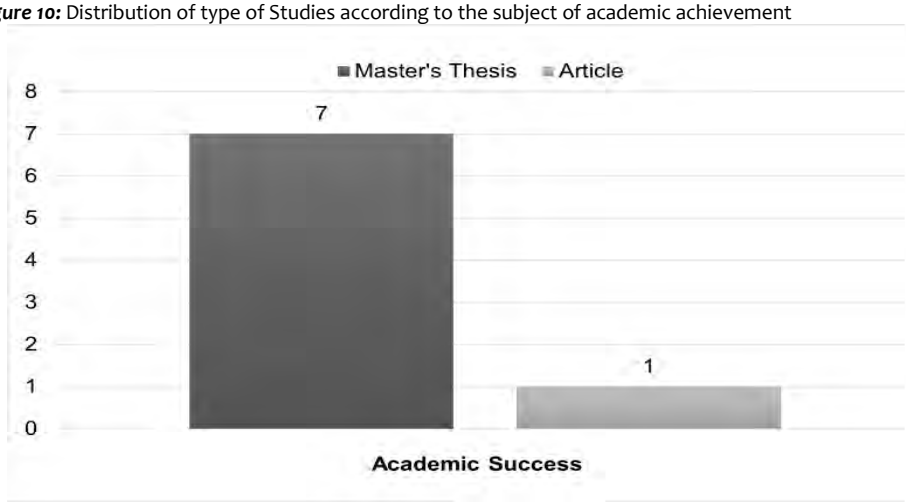
Distribution of the studies according to the study subject is given in Figure 9.

Figure 9: Distribution of Studies by Subject



According to Figure 9, the most discussed topics on the quantum learning model were "academic achievement" (Ay, 2010; Fenar, 2021; Girit, 2011; Kanadli & Unal, 2015; Simsek, 2016; Sohretli, 2014; Unal, 2019; Yilgen, 2014) "attitude" (Alaca, 2014; Ay, 2010; Cakir, 2013; Simsek, 2016; Sohretli, 2014) and "science education" (Alaca, 2014; Ay, 2010; Cakir, 2013; YalCintas, 2019; Yilgen, 2014) studies. While the researchers focused on "academic achievement" (Ay, 2010; Fenar, 2021; Girit, 2011; Kanadli & Unal, 2015; Simsek, 2016; Sohretli, 2014; Unal, 2019; Yilgen, 2014) in their thesis studies, they worked more on "social studies" (Celik, 2017; Fenar, 2021; Guler & Yazici, 2018; Gulersoy & Gulersoy, 2017; Unal, 2019), "blended learning" (Cirak, 2016; Kurt, 2017), "quantum learning cycle" (Cirak, 2016; Kurt, 2017) and "holistic approach" (Sarigoz, Cengiz, & Koca, 2015) in their articles.

Figure 10: Distribution of type of Studies according to the subject of academic achievement



When the studies were examined according to subject, it was seen that the highest number of studies were conducted on "academic success", and a total of eight studies were found out of these studies stating that QLM had a positive effect on academic achievement. While seven of these studies were master's theses, one of them was an article. No doctoral dissertation dealing with academic achievement has been found. The distribution of the studies, the subject of which is academic achievement, is given in Figure 10.

Discussion and Conclusion

In order for learning to be permanent and meaningful in individuals, the learning process should be made enjoyable. The best way for this is to plan the process according to the individual learning needs of the students. At this point, QLM enables students to plan correctly, use time efficiently, and listen effectively. (Kusuma, Gunarhadi, & Riyadi, 2018; Yilgen, 2014).

It is desirable that students use their full potential in their learning. A pleasant and comfortable teaching environment will enable them to express themselves more easily processes (Hughes & Toohey, 1992). QLM also aims for students to use their full potential in their learning process (Kusuma & Pramesti, 2020; Utari, Utomo, Zukhrufurrohmah, 2020). It will be a teaching model that teachers who can provide an environment where students can express themselves can prefer. Also, QLM is an easily transferable, easy-to-implement, and innovative model for teachers (Danaryi & Sari, 2014; Mantra, Handayani, & Suwandi, 2019).

According to the literature review, researchers mostly used QLM in their master's theses, while it was used least in doctoral theses. Additionally, it was determined that most of the 27 studies

conducted between 2010-2021 were conducted in 2019. Four of these studies are master's theses and two are articles. Although thesis studies were conducted between 2010-2014, no article was found that has been brought to the literature between these years. Furthermore, in studies on QLM, it has been determined that researchers mostly prefer mixed research model and experimental design as model and research design, respectively. Even though the target audience was mostly secondary school students, studies were also identified with different sample groups. Studies on QLM have been conducted with different sample numbers. Small samples are generally preferred in qualitative studies (Baskale, 2016). It was concluded that the studies with a small sample size (Cagli, 2019; Kurt, 2017) among the studies examined were conducted with qualitative design. Quantitative studies, on the other hand, are preferred because a general meaning is inferred with the generalization estimations of the data obtained from individuals (Yagar & Dokme, 2018). It was observed that the studies with a large sample size (Gullu, 2010; Yilgen, 2014) were conducted with the quantitative research method. When the studies were examined in terms of data collection tools, it was determined that most of the data were collected with scales and tests. The reason for this can be shown to be that most of the studies conducted used mixed and quantitative research methods.

In the studies examined, it was seen that the least preferred data collection tools were questionnaires and inventory. The reason for this is that qualitative studies are less preferred than quantitative studies. When the studies were examined according to data analysis methods, it was concluded that content analysis was preferred most in both theses and articles. When the studies were examined according to their subjects, it was determined that academic achievement, attitude, and science education subjects were mostly included in QLM. According to studies found in the literature, there are many studies that have determined that the quantum learning model has a positive effect on increasing academic achievement. In the studies examined (Ay, 2010; Girit, 2011; Kanadli, Unal, & Karakus, 2015; Simsek, 2016; Sohretli, 2014; Unal, 2019; YalCintas, 2019; Yilgen, 2014), it was concluded that the quantum learning model increases academic achievement. It has been concluded that QLM increases students' academic achievement, ensures meaningful learning, increases permanence in learning, and is effective in raising creative individuals and bringing them into life and society (Eriyanto, Inganah, & Utomo, 2019).

Also, it has been seen that other studies have been done in the last six years, that is, since 2017 (Afacan & Gurel, 2019; Altin & Saracaloglu, 2019; Amin et al., 2021; Ariftian and Madjdi, 2020; Kusuma, Gunarhadi, & Riyadi, 2018; Mantra, Handayani, & Suwandi, 2019; Nurmali, 2020; Rustam, Murdana, & Usman, 2022; Utari, Utomo, & Zukhrufurrohmah, 2020; Zeybek, 2017). Some studies have reported that QLM increases learning skills and contributes positively to academic success (Afacan & Gurel, 2019; Kristiyanto, 2019).

Concluded that it contributed positively to the attitudes of the students and that QLM facilitated learning and increased student success because it made learning enjoyable (Zeybek, 2017). In addition, it has been stated in some studies that QLM has achieved positive results in foreign language teaching. In these studies, it has been emphasized that it makes learning both fun and permanent because it appeals to students' multiple learning senses (Altin and Saracaloglu, 2019; Mantra, Handayani, & Suwandi, 2019; Masrur, 2020).

This study is limited to the studies carried out on QLM between 2010-2021 (the last 11 years) in Turkiye and accessed only through the TR index and YOK Thesis Center databases. The following recommendations can be made with the results of this research:

1. In the study, articles, and theses in Turkiye were examined. In future research, it is recommended that studies carried out abroad on the quantum learning model should be added to the review and more comprehensive studies should be conducted.
2. While the academic achievements of the studies on the quantum learning model were

conveyed, it was seen that there was no research in the affective field. For this reason, it is thought that investigating the effects on students' success in the affective field will contribute to the literature.

3. Examining the studies developed on the quantum learning model in each branch will provide the opportunity to see how the effect of this teaching model in other courses may differ.

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Biographical notes:

Merve Nur Köroğlu graduated from university education at Kahramanmaras Sütçü Imam University, Department of Science Education between 2015-2020. She took English preparatory education in her first year of university and finished her preparatory education in second place. Between 2018-2019, she studied at the University of Lisbon which is in Lisbon, Portugal, with the Erasmus project. After graduating from university, she started her master's degree with thesis in the field of Science Education at Erciyes University. She is still continuing her education as a master student.

Esra Kizilay is a assistant professor in the Department of Science Education at the Education Faculty of Erciyes University. Her research interests are STEM education, science education, technology education, and environmental education.

Emine Güneri is a professor in the Department of Science Education at the Education Faculty of Erciyes University. Her research interests are physics, physics education, science education, and teacher education.