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Examining the Studies on the Advantages of Rural Areas in Mathematics Education

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Abstract. Problems related to education are mostly addressed in rural areas. In the literature, it is stated that qualified (mathematics) education(in) can also be provided in rural areas. The ability to provide qualified education in the countryside depends on being aware of the advantages provided by the countryside in education and taking advantage of these advantages, as well as identifying and solving problems. In our study, the advantages of rural education expressed in national and international literature were compiled using the document review model of qualitative research. As a result of the inductive content analysis, six themes expressing the educational advantages provided by the countryside were created as healthy environment and nutrition opportunities, local community values, the social function of the school is strong, teachers are effective in the local role, the number of students per teacher is low and a rich concrete living experience. The proposals expressed in the literature that will increase the use of the advantages provided by education in rural areas have been presented by comparing them with village institutes.

Keywords. Advantages of education in rural areas, mathematics education, village institutes, document review, content analysis.

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TDK (2023) defines rural areas as places where production based on natural resources is more common economically, where the average income level is generally lower than in cities, where there is a unique cultural structure and where social life is determined within the framework of traditions. The concept of rural can be defined in different ways based on administrative status, population and economic activities (Yoloğlu & Zorlu, 2020). Due to these differences in definitions, the scope of the concept of rural varies in countries around the world and each country develops unique education policies for rural education (Sevinç, Kantar Davran & Sevinç, 2016). Considering both the cultural dynamics of education and the characteristics of rural education, a national education policy is vital to ensure equal and quality education in rural areas. According to the 1739 numbered Turkish National Education Basic Law, equality of opportunity in education should be provided for every citizen of our country. It is the responsibility of the state to ensure that children living in rural areas also benefit from equal and qualified education (Yağan Güder, 2019).

From the foundation of the Republic until the multi-party period of 1950's, considering that nearly 75% of the population lived in rural areas, special education policies such as village institutes, village teacher schools, education courses and community centres were put into practice for the rural population. After this period, there were no special education policies for the rural population in Turkey; the educational problems of the rural population were tried to be solved through centralised village schools and regional primary boarding schools (YİBO) (Sevinç, Kantar Davran & Sevinç, 2016, p. 260). In Table 1 below, the number of students in disadvantaged student groups compiled from the 2021-2022 National Education Statistics data published by the Ministry of National Education is presented for the secondary school level. According to the data in Table 1, it is seen that the number of students in disadvantaged groups among all secondary school students is expressed in thousands.

Table 1.

Number of secondary school students in disadvantaged student groups (MEB, 2022).

Disadvantaged group	**Total number of students**	**Number of male students**	**Number of female students**
In rural secondary schools	239 222	121 868	117 354
Regional boarding secondary schools	51 152	26 228	24 524
Secondary schools with transported education	416 577	211 349	205 228
In secondary schools across Turkey	**5 293 067**	**2 697 181**	**2 595 886**

The problems experienced by disadvantaged student groups are expressed in the literature: Although transport education provides equal opportunity, it is stated by the students that it creates road fatigue, reduces the free time left for the student, and causes communication problems among peers (Şimşek & Büyükkıdık, 2017). In village schools, there are problems such as economic difficulties, material deficiencies, problems in school-parent communication and inadequacy of teachers' readiness for village conditions, and this situation can negatively affect the learning process (Sidat & Bayar, 2018, p. 247).

As of the 19th century, development studies have started to be carried out in rural areas (Howley, 1997). Rural areas have some unique characteristics. While supporting rural life, planning should be made in accordance with these characteristics (Ece, 2012). Garan (2005) states that rural-specific arrangements were not made in the curriculum renewal studies in our country and that rural education problems could not be overcome for this reason. It is observed that studies on rural education, especially mathematics education, are few in both national and international literature. It is stated that there is a need for studies comparing rural and urban education opportunities and characteristics. Education in urban and rural areas is unequal due to differences in social life (Garan, 2005). Urban population increases with industrialisation and social development. With urbanisation, economic, social, political and cultural changes are experienced and rural areas remain in the background. Curricula that are not specific to rural areas negatively affect the city, which has started to become rural with intensive migration (Akbayır & Ece, 2016).

Arnold, Newman, Gaddy, and Deen (2005) analysed rural education research conducted in the USA between 1991 and 2003. They found that there was a lack of quality research conducted in rural areas. According to their findings, the relationship and values between school and community are different in rural areas, and there are different variables such as creating learning opportunities, the relationship between school size and student achievement, the relationship between school and district capacity, and the expectations of the community and parents from schools that need to be examined separately in rural areas. In their analysis of the literature on rural education, Howley, Howley, and Huber (2005) report that there are very few empirical and applied studies examining mathematics education in rural schools and communities.

It is known that educational dynamics are different in rural and urban areas. However, according to Howley (2003), there are also differences in the educational achievement of rural areas. Regional classifications, regional population, distribution of local and community resources, regional community values, school climate, and focus on goals are the sources of educational differences between rural areas. Many reasons such as parents' educational characteristics (Çapuk & Ünsal, 2017; Yağan Güder, 2019), parenting interventions (Palavan & Göçer, 2017), limited access to resources (Atmaca, 2004; Vernon-Feagans, Kainz, Amendum, Gingsberg, Wood, & Bock 2012; Yağan Güder, 2019) are against rural educational environments. In rural areas, children work with their families and participate in home life. Since family education is inadequate, they cannot get help with their homework, and parents in rural areas raise children with stricter and harsh methods (Garan 2005). According to Faragher, Hill, and Clarke (2016), schools in rural areas are small and employ few education specialists. This situation may cause new teachers not to benefit sufficiently from their experienced colleagues. Teachers may have to teach outside their field, there are few opportunities for professional development, and the declining rural population affects policy development. Tachie and Chrishe (2013) listed the reasons for low mathematics achievement in rural schools as lack of materials, negative teacher behaviour, apathy, and absenteeism. Anderson (2005) states that students studying in rural high schools do not find advanced mathematics useful because they do not use it in their daily lives. Anderson and Chang (2011) found that rural high school students graduated with fewer mathematics credits and their mathematics level remained at a low level. Williams (2005), based on PISA 2000 results, examined the distribution of rural mathematics achievement by country. In 14 out of 24 countries, rural scores were lower than

urban scores. Williams associates this situation with low socioeconomic level and states that it is directly proportional to community size.

It is also stated in the literature that rural education has important advantages. Kearney (1994), in his study titled "The Advantages of Rural Schools", mentioned many advantages that are also mentioned in other studies. For example, Boylan, Sinclair, Simith and Squires (1993) analysed teachers' survey results and reported that rural schools offer a healthier, quieter, safer life, lower crime rates and more clean, open spaces. A study analysing the educational advantages of rural areas was conducted by Alspaugh (1992). The difference between the scores of rural and urban areas in reading achievement in aptitude tests was very small. In addition, it was determined that socioeconomic-based discrimination in urban areas decreased the academic achievement of low socioeconomic students living in urban areas. In rural areas, it was stated that there was no socioeconomic-based discrimination. The low divorce rate in rural areas was evaluated as a situation in favour of students (Kaplan, 2010). Rural students have more regular breakfast and healthier eating habits than urban students. This situation has positive effects on course success (Onyechi & Ugwunnadi, 2009). The social structure in rural areas has a closer communication and children develop their expression skills in this environment. Rural society is in solidarity. Teachers work more devotedly due to their strong ties with the community (Anderson, 2005; DeYoung & Kannapel, 1999; Yurttaş, Yavuz, & Atasan, 2007). In rural education institutions, issues such as direct communication, creativity, less antisocial student behaviours, less demanding excursion activities, high level of teacher prestige and less bureaucracy are advantages (Batey & Hart-Landsberg, 1993; Özpınar & Sarpkaya, 2010). Rural small schools have advantages in terms of individual attention, co-operative learning, low levels of discipline problems, close co-operation between school and community, high teacher motivation resulting from less bureaucratic and more flexible administrative structure, more time and space for extra-curricular activities (Kearney, 1994). Combined classes, which are common in rural areas, offer flexible working groups due to age differences. An environment conducive to peer education is created (Feu Gelis, 2003, as cited in Morales-Romo, 2017). Anderson (2005) states that dropout rates are lower in rural schools. Preston (2006) analysed the experiences of rural teachers and reported that teaching activities and classroom management are easier in rural areas and high participation in extracurricular activities is observed. Students living in rural areas have a higher sense of responsibility and life experiences. In rural areas, children's participation in family life enables them to be

hardworking, honest, co-operative and interested in life, and improves their self-confidence (Salamon, 1995; as cited in Taş, 2010). The environmental perceptions of high school students living in rural areas are higher than their peers living in urban areas (Terlemez, 2018). A similar result was found for secondary school students in Bölükbaşı's (2020) study; the visual perception scores of children living in the village were higher. In addition, children living in rural areas start preschool education naturally and have more opportunities to make observations in their lives. Thus, they have the opportunity to experience more concrete experiences in gaining autonomy than their urban peers. They have the opportunity to learn by doing and experiencing because they live in touch with nature (Şeker, 2015; Yurttaş, Yavuz, & Atasan, 2007). Outdoor teaching activities support the development of motor skills, which can positively affect the development of cognitive and social skills (Peltonen, 2002, as cited in Kilpimaa, Määttä, & Uusiautti, 2012). Students in rural areas find mathematics valuable and see it as an important tool to increase their welfare (Lucas & Fugitt, 2007; Toker, 2015). Students in rural areas do not have a problem such as technology addiction, while this is a common problem in urban areas (Gökçek & Toker, 2015).

Howley, Howley and Huber (2005) state that in rural schools, local people believe that schools are strong. They reported that students have strong communication skills and that there are many community members and students willing to learn despite the lack of economic and technological opportunities. They state that long-term professional development, community involvement and technological supports that will increase the capacity of teachers and administrators will positively affect rural areas.

According to Çiftçi (2010), mathematics achievement is low in rural areas, but positive perceptions of mathematics are high. In the 2003 PISA, Turkish students living in the Eastern and Southeastern Anatolia Regions, which have rural characteristics, had higher positive attitudes despite low achievement. Similarly, in TIMSS 2007 results, although mathematics achievement was below the average in rural countries such as Algeria, Egypt, Oman and Morocco, attitudes were found to be positive (Çiftçi, 2010). Karadeniz and Karadağ (2014), in their study examining mathematics anxiety and attitudes in rural areas, state that rural students need more support in terms of self-confidence in mathematics.

In addition to the advantages of rural areas, suggestions to increase the utilisation of these advantages have been another research question in the literature. It can be said that the

studies providing suggestions are mostly seen in recent years. Pegg and Pannizon (2011) state that rural areas are behind in PISA results for Australia and that increasing the cooperation between rural secondary mathematics teachers and students and creating learning networks can increase mathematics achievement. Murphy (2019) examined an Australian rural school with high mathematics achievement. He reported that valuing mathematics, building teacher capacity, career education, vocational education and training, creating community connections, and individualised instruction increased mathematics achievement. Smith (2002) states that locally based education can be a solution for different rural areas with its flexible structure and there are five perspectives for this. These perspectives are listed as cultural research (ethnomathematics research), nature research, solving real world problems, entrepreneurship opportunities, and introduction to community life (as cited in Showalter, 2013).

Showalter (2013) states that the alignment of culture, terrain and content through locally based mathematics education, in other words, education by region, increases the success of rural mathematics education. This result is explained by the fact that locally based mathematics education eliminates the disconnect between classroom mathematics and life mathematics. Palinussa, Molle, and Gasperz, in their studies conducted in 2017 and 2021, state that realistic mathematics education in Indonesia is a teaching method designed specifically for the rural context. According to the research, using the existing daily context increases the ability to understand the maths problem in the brain, students do not have difficulty in communicating. Close mathematical examples facilitate the child's participation in reasoning processes.

Although in the international literature, suggestions to increase the utilisation of the educational advantages of rural areas have been clustered in recent years, in the history of Turkish education, these suggestions go back much further. As a result of the urgent need for national development and the existing socio-economic situation, the village institutes, which were a unique educational initiative, are a very successful example of rural education. The necessity for rural education to have national qualities has led our educators to examine the village institutes in order to find solutions to the problem of rural education in our country.

Village institutes were established with the aim of learning by doing, learning by living, full learning, raising individuals and educators who can solve problems. Since these goals could only be achieved through practical education, village institutes were concentrated in rural areas (Tural, 2016). The same educational goals are also valid in today's understanding of education.

The physical facilities of schools in urban centres are insufficient in the face of population density. It is important for our national welfare to be able to see the opportunities offered by rural education and to ensure that every student benefits from these opportunities at the highest level.

In village institutes, cultural courses were common, while agricultural and technical courses were modified according to the climate and needs of the region where the institute was located (Metin Göksu, 2020). Today, it can be predicted that differences appropriate to the region will increase success, provided that the basic cultural framework for rural areas remains the same. In addition, village institutes also provided important opportunities for learning environments outside the classroom. Thus, it is seen that rural areas create learning opportunities with work-oriented activities intertwined with nature (Tural, 2016).

Işıldak and Saylar (2022) examined the teaching in village institutes in terms of its suitability for STEM activities. As a result, they reported that the village institutes carried out a teaching that was suitable for 21st century skills, supported the theory of multiple intelligences, and supported by the technology of the period. In the research, it is stated that the tasks such as animal and plant care given to the students develop the awareness of responsibility, contribute to the power of observation, and today, village schools with transport have the potential to establish their own observatories with advantages such as altitude and air cleanliness.

When the national and international literature is analysed, the number of studies expressing the problems related to rural education and especially mathematics education is quite high. On the other hand, there are also studies finding that the region of study does not affect teachers' teaching practices. For example, Mohan, Swabey, and Kertesz (2019) studied 197 teachers in remote, rural, and urban schools in Fiji and reported that there was no difference in teaching activities (as cited in Palas, 2022). However, it is accepted among mathematics educators that learning mathematics can also take place qualitatively in rural areas due to the fact that mathematics learning depends on the individual effort of the student and its content is the same content based on logical inference (Arons, 1997; DeYoung, 1995, as cited in Howley, 2005). Benjamin (2006) compared the mathematics achievement of 5th grade students in rural America, China and Taiwan. He reported that students in rural China and Taiwan were more successful than students in rural America and that this difference could not be explained only

by cultural factors. The quality of mathematics education in rural education depends on the effective use of opportunities in rural areas. For this reason, in this study, the advantages of rural education and mathematics education in national and international literature will be compiled and a comparison will be made of the situations that are seen as advantages nationally and internationally. As a result of our study, suggestions suitable for the effective utilisation of the advantages of rural education will be presented by comparing them with the village institutes.

In line with the above-mentioned objectives of our study, the question of how the advantages offered by rural areas to education are found in the literature will be sought. The related sub-questions can be listed as follows:

1. How is the distribution of the studies on the advantages offered by rural areas to education according to whether they were conducted in Turkey or abroad?

2. How is the distribution of studies on the advantages of rural areas in education according to years?

3. How is the distribution of the studies on the advantages offered by rural areas to education according to the type of research?

4. How is the distribution of the studies on the advantages of rural areas in education according to the research method?

5. How is the distribution of the studies on the advantages offered by rural areas to education according to the study group?

6. How is the distribution of the studies on the advantages of rural education according to the advantages of rural education?

7. How is the distribution of the studies on the advantages of rural education according to the suggestions for increasing the utilisation of the advantages of rural education?

Method

In this section, the research model, documents analysed, data collection and data analysis are explained.

Research Model

Qualitative research perspective was adopted in the study and document analysis model was used. Qualitative research is research in which qualitative data collection methods such as observation, interview and document analysis are used and a qualitative process is followed to reveal perceptions and events in a realistic and holistic way in a natural environment (Yıldırım & Şimşek, 2013, p. 45). Document analysis can be defined as the collection and examination of written and visual materials. It can be used in both qualitative and quantitative research. In qualitative research, it is important to evaluate documents according to the structure of that culture and the meanings attributed to them (Sönmez & Alacapınar, 2021, p. 110).

Analysed Documents

Review articles are written to synthesise the responses of studies published in scientific databases and journals to a specific research question. In systematic review articles, the selection criteria of the studies should be determined (Gülpınar & Güçlü, 2013, as cited in İlker & Melekoğlu, 2017). In this study, it is aimed to compile the advantages that rural areas offer to students and expressed in the literature. For this purpose, national theses and articles and international theses and articles were collected. The number of studies directly addressing the advantages of rural education is very few. For this reason, studies that address the advantages and disadvantages of rural education together, studies that offer solutions to take advantage of the opportunities of the countryside, and studies that examine the village institutes that have been successfully implemented in rural areas in Turkey were included. A total of 38 national and international studies, including 24 articles, 8 master's theses, 1 doctoral thesis, 1 book, 2 reports and 2 studies accessed from secondary sources, were analysed. Since the number of qualified studies related to the problem of our research in the literature is small, the studies that can be accessed from secondary sources were not eliminated. The original texts of these studies could not be accessed from the databases. It was considered that the selected studies belong to different cultures and different years. Because this diversity will increase the generalisability of the study in the context of different rural definitions and rural characteristics.

Data Collection

The documents were accessed from Google Scholar, Eric index, National Thesis Centre and Dergipark databases. The search words were "rural education", "rural mathematics education", "rural and urban schools", "village schools", "the advantages of rural education", "village institutes", "regional boarding schools". The 187 articles and theses that were thought to be related were downloaded. The abstracts, sub-headings and findings of the studies obtained from the databases were analysed and a categorisation was made according to whether they expressed the opportunities of rural education or not. Ethnomathematics studies, studies examining the effectiveness of a certain teaching method in rural areas and place-based mathematics education studies were excluded from the review. In the selection of the studies, no limit was set in terms of year, method, study group, etc., and the studies that could be accessed were categorised. As a result, a total of 38 studies were evaluated to be suitable for the purpose of our study.

Data Analysis

The collected documents were classified according to the years of publication, the type of the research, the method used and the sample of the research, and frequency and percentage values were tabulated.

Internal validity (credibility) in qualitative research requires that the findings are presented in a consistent and confirmable manner by different researchers. Lincoln and Guba (1985) state that one of the methods recommended to ensure credibility is triangulation (Yıldırım & Şimşek, 2021). In order to increase the internal validity of our research, the study on which each finding is based is indicated in the writing of each finding. External validity (transferability) in qualitative research can be defined as the applicability of the results in environments with similar characteristics. Detailed description and purposive sampling methods are recommended to increase transferability (Yıldırım & Şimşek, 2021). In our study, it was ensured that the reader could clearly see the raw data organised according to themes and the sources that led to this data. In addition, in the selection of the documents analysed, attention was paid to diversity in terms of research method, research type and rural area studies of different cultures. Reliability was aimed to be ensured by the authors coding separately while determining the content of the themes and assigning the agreed codes to the common theme.

The advantages of rural education identified in the collected documents were analysed by inductive content analysis method. Inductive content analysis is based on the analysis of the examined data with the help of codes created around a certain subject (Yıldırım & Şimşek, 2021). As a result of the examination of the collected studies, the situations presented as the advantage of studying in the countryside were associated with the components of the learning process and codes were obtained. The codes obtained were analysed according to their reasons, and the reasons they were associated with formed themes. Advantages arising from similar reasons were grouped under a theme. The themes created as a result of the analyses are as follows:

- Healthy environment and nutrition opportunities,
- Local community values,
- Strong social function of the school,
- Teachers being active in the local role,
- Low number of students per teacher and
- Rich concrete experience.

The data were also analysed by making a comparison of rural education opportunities in domestic and international studies. Recommendations aimed at taking advantage of rural education opportunities are presented in conjunction with analyses of studies examining village institutes. At the end of each analysis, tables were created to facilitate interpretation.

Results

In this section, the distribution of the analysed studies according to years, research type, research method, study group, advantages of rural education and suggestions for increasing the utilisation of these advantages are presented in tables.

Analysed studies

First of all, all studies analysed in this study are classified in Table 2 according to whether they were conducted in Turkey or abroad.

Table 2.

Distribution of the analysed studies according to whether they were conducted in Turkey or abroad

Researches Conducted Abroad	**Researches Conducted Domestically**
Alspaugh (1992), as cited in Kaplan (2010)	Yurttaş, Yavuz and Atasan (2007), as cited in Bölükbaşı (2020)
Boylan, Sinclair, Simith and Squires (1993)	Özpınar and Sarpkaya (2010)
Batey and Hart-Landsberg (1993)	Çiftçi (2010)
Kearney (1994)	Kaplan (2010)
Salamon (1995), as cited in Taş (2010)	Taş (2010)
Arons (1997), as cited in Howley, Howley and Huber (2005)	Karadeniz and Karadağ (2014)
DeYoung ve Kannapel (1999), as cited in Howley ve Howley (2005)	Şeker (2015)
	Toker (2015)
Peltonen (2002), as cited in Kilpimaa, Määttä and Uusiautti (2012)	Gökçek and Toker (2015)
Smith (2002), as cited in Showalter (2013)	Tural (2016)
Anderson (2005)	Akbayır and Ece (2016)
Howley, Howley and Huber (2005)	Sevinç, Kantar Davran and Sevinç (2016)
Preston (2006)	Terlemez (2018)
Benjamin (2006)	Bölükbaşı (2020)
Lucas as cited in Fugitt (2007)	Metin Göksu (2020)
Onyechi and Ugwunnadi (2009)	Işıldak and Saylar (2022)
Pegg and Pannizon (2011)	
Showalter (2013)	
Feu Gelis (2003), as cited in Morales-Romo (2017)	
Palinussa, Molle and Gasperz (2017)	
Murphy (2019)	
Mohan, Swabey and Kertesz (2019), as cited in Palas (2022)	
Palinussa, Molle and Gasperz (2021)	

As seen in Table 2, 22 of the 38 studies examined (58%) were conducted abroad and 16 of them (42%) were conducted domestically. The number of foreign and domestic studies analysed is close to each other.

Distribution of the analysed studies according to years

Table 3 shows the distribution of the analysed studies according to years.

Table 3.

Distribution of the analysed studies according to years

Years		Number of Researches
1992		1
1993		2
1994	**There are 7 studies before 2000.**	1
1995		1
1997		1
1999		1
2002		2
2003	**There are 10 studies between 2000 and 2010.**	1
2005		2
2006		2
2007		2
2009		1
2010		4
2011		1
2013	**There are 17 researches between 2011 and 2020.**	1
2014		1
2015		3
2016		3
2017		1
2018		1
2019		2
2020	**After 2020, there are 4 researches.**	2
2021		1
2022		1

As seen in Table 3, the issue of the advantages of rural education has been studied since the early 1990s. The number of studies on this subject has also increased over time. Between 2000 and 2020, approximately 50 per cent of the total number of studies were conducted. Accordingly, it can be said that the advantages of rural education and suggestions for utilising these advantages have been a topic that educators have focused on after 2010. The highest number of studies was conducted in 2010 with four studies. This is followed by 2015 and 2016 with three studies.

Distribution of the analysed studies according to type

Table 4 shows the distribution of the analysed studies according to their types as article, master's thesis or doctoral thesis.

Table 4.

Distribution of the analysed studies according to their types as article, master's thesis, doctoral thesis, report or book

	Articles	**Master Theses**	**Doctoral Theses**	**Books**	**Reports**
Total	24	8	1	1	2
National	9	7	-	-	-

De Young and Kannapel (1999) and Peltonen (2002) studies could not be accessed directly and their contents were accessed from secondary sources. No information about their species could be inferred.

According to Table 4, approximately 63% of the analysed studies are articles and 21% are master's theses. All but one of the master's theses were conducted in Turkey. Only 38 per cent of the articles were written in Turkey.

When Table 2 and Table 4 are analysed together, it is seen that articles, books and reports have been written since old years, while master's and doctoral theses and dissertations belong to studies after 2005.

Distribution of the analysed studies according to research method

Table 5 shows the distribution of the analysed studies according to the research method.

Table 5.

Distribution of the analysed studies according to research method

Qualitative	Quantitative	Qualitative and Quantitative
18	10	4
Since Arons (1997) is a book and five articles were accessed from secondary sources, a total of 32 research methods were included in the table.		

According to Table 5, the number of qualitative studies is more than half of the analysed studies. Qualitative studies were preferred to reveal the educational situation in rural areas because they allow in-depth data collection and interpretation of data. Three of the four studies that used both qualitative and quantitative methods together were master's theses. Among qualitative studies, document analyses and among quantitative studies, correlational studies are the majority.

Distribution of the analysed studies according to the study group

Table 6 shows the distribution of the analysed studies according to the study group.

Tablo 6.

Distribution of the analysed researches according to the study group

Student	Teacher	All stakeholders of educationı
12+4=16	7+4=11	2 students, teachers, parents, administrators, ...
Four studies, Çiftçi (2010), Kaplan (2010), Toker (2015), Gökçek and Toker (2015), were conducted with students and teachers. Above 12 refers to the number of studies conducted only with students and 7 refers to the number of studies conducted only with teachers. Seven studies were document analyses, one study was based on a book and five studies were accessed from secondary sources. Table 6 shows 12 + 4 + 7 + 2 = 25 studies.		

According to Table 6, a total of 19 studies have one study group. Only six studies collected data from different study groups. Eight of the 10 quantitative studies were conducted with students. It can be evaluated that quantitative studies are suitable for reaching a large number of students. The studies conducted with teachers were either qualitative or both

qualitative and quantitative. It can be said that the small number of participating teachers is determinative in this situation. Two studies aiming to reach all stakeholders of education were also conducted with qualitative method. Three of the four studies that reached teachers and students together were master's theses that used both qualitative and quantitative methods.

Distribution of the analysed studies according to the advantages of rural education

In this section, the advantages of rural education stated in the studies examined were subjected to inductive content analysis. As a result of the examination of the collected studies, the situations presented as the advantages of rural education were associated with the components of the learning process and codes were obtained. The codes obtained were analysed according to their reasons, and the reasons they were associated with formed themes. Advantages arising from similar reasons were grouped under a theme. In order to ensure objectivity, the sources on which the codes are based are given. The themes created as a result of the analyses are as follows:

- Healthy environment and nutrition opportunities,
- Local community values,
- Strong social function of the school,
- Teachers being active in the local role,
- Low number of students per teacher and
- Rich concrete experience

Theme 1-

Advantages associated with healthy environment and nutritional opportunities:

- A quieter environment *Sinclair, Simith and Squires (1993)*
- Excess of clean and open spaces *Sinclair, Simith and Squires (1993)*
- Regular breakfast and healthier eating habits *Onyechi and Ugwunnadi (2009)*

Theme 2-

Advantages associated with local community values:

- Non-discrimination on socio-economic grounds *Alspaugh (1992)*

- Lower crime rates *Sinclair, Simith and Squires (1993)*

- Low divorce rates *Alspaugh (1992)*

- Solidarity-oriented close communication *Anderson (2005), DeYoung and Kannapel (1999), Yurttaş, Yavuz and Atasan (2007)*

- Few antisocial student behaviours *Batey and Hart-Landsberg (1993), Özpınar and Sarpkaya (2010)*

- Positive attitudes towards mathematics and seeing it as a tool to increase life well-being *Çiftçi (2010), Lucas and Fugitt (2007), Toker (2015)*

- A society willing to learn *Howley, Howley and Huber (2005)*

- Lower dropout rates *Anderson (2005)*

- High participation in extracurricular activities *Preston (2006)*

Theme 3-

Advantages associated with the strong social function of the school:

- Close co-operation between school and community *Kearney (1994)*

- Local community belief that schools are strong *Howley, Howley and Huber (2005)*

Theme 4-

Advantages associated with teachers' effectiveness in the local role:

- High level of teacher prestige *Batey and Hart-Landsberg (1993), Özpınar and Sarpkaya (2010)*

- Increased teacher dedication as a result of strong ties with the community *Anderson (2005), DeYoung and Kannapel (1999), Yurttaş, Yavuz and Atasan (2007)*

- High teacher motivation due to less bureaucratic structure and more flexible administrative structure *Kearney (1994)*

Theme 5-

Advantages associated with the low number of students per teacher:

- Direct communication in educational institutions *Batey and Hart-Landsberg (1993), Özpınar and Sarpkaya (2010)*

- Supporting creativity *Batey and Hart-Landsberg (1993), Özpınar and Sarpkaya (2010)*

- Low level discipline problems *Kearney (1994)*

- The fact that excursion activities require less effort *Batey and Hart-Landsberg (1993), Özpınar and Sarpkaya (2010)*

- Individualised teaching opportunity *Kearney (1994)*

- Easier implementation of cooperative teaching activities *Feu Gelis (2003), Kearney (1994)*

- Easier classroom management *Preston (2006)*

Theme 6-

Advantages associated with rich concrete experience:

- More time and space for extra-curricular activities *Kearney (1994)*

- Self-confident, hard-working, honest and co-operative students who have developed a sense of responsibility arising from being a partner in family life *Salamon (1995)*

- Starting preschool education naturally *Şeker (2015), Yurttaş, Yavuz and Atasan (2007)*

- Improved observation ability *Şeker (2015), Yurttaş, Yavuz and Atasan (2007)*

- Early development of psychomotor skills and cognitive and social skills *Peltonen (2002), Şeker (2015), Yurttaş, Yavuz and Atasan (2007)*

- Students who gained autonomy early *Şeker (2015), Yurttaş, Yavuz and Atasan (2007)*

- Students with developed communication skills *Howley, Howley and Huber (2005)*

- Students with developed environmental perceptions *Terlemez (2018)*

- Students with high visual perception scores *Bölükbaşı (2020)*

- Students without technology addiction *Gökçek and Toker (2015)*

Distribution of the analysed studies according to their recommendations for increasing the utilisation of educational advantages in rural areas

The suggestions offered by the studies analysed in the study to increase the utilisation of educational advantages in rural areas are as follows:

- Co-operation between rural teachers and students should be increased. *Murphy (2019), Pegg and Pannizon (2011)*

- Co-operation between rural educators and academics should be increased. *Pegg and Pannizon (2011)*

- Technological support should be increased. *Howley, Howley and Huber (2005)*

- Valuing mathematics should be emphasised. *Murphy (2019)*

- Career training should be provided to students and teachers. *Murphy (2019)*

- In-service trainings should be increased. *Murphy (2019)*

- Individualised teaching should be emphasised. *Murphy (2019)*

- Real world problems based on realistic mathematics education should be included. *Palinussa, Molle, and Gasperz (2017) and (2021), Smith (2002)*

In addition to the suggestions presented in the international literature, the following suggestions are presented in the national literature based on the example of village institutes.

- Local-based education *Metin Göksu (2020), Smith (2002)*

- Targeting applied education (learning by doing, learning by living, full learning) *Tural (2016)*

- The share of activities intertwined with nature should be increased *Tural (2016)*

- STEM-based activities should be included *Işıldak and Saylar (2022)*

Locally based education, in other words, education according to the region, harmonises culture, terrain and content. This perspective was applied in the village institutes by differentiating agricultural and technical courses according to the climate and needs of the region where the school was located. Basic cultural courses, on the other hand, were common in accordance with the goal of raising citizens with a common level of consciousness and culture.

Conclusion and Discussion

When the literature is analysed, it is seen that a significant number of studies on rural education have been conducted. In the discussion section, the relevant studies will be sampled sufficiently to emphasise the different aspects of our study from the studies in the literature.

Arnold, Newman, Gaddy, and Deen (2005) presented a review of rural education research conducted in the USA between 1991 and 2003. Howley, Howley and Huber (2005) published a study analysing the literature on rural education. As explained in the introduction, these studies analysed rural education research from a general perspective.

On the other hand, there are also some studies that directly include the advantages of rural education in different dimensions. Some of these studies are focused on education, some on mathematics education. They also reported rural educational advantages while investigating a different research question. Çiftçi (2010), Murphy (2019), Akbayır and Ece (2016), Kilpimaa, Määttä, and Uusiautti (2012), and Yağan Güder (2019) can be given as examples. Boylan, Sinclair, Simith, and Squires (1993), another study that reached the superiority of rural education as an indirect result, expressed the superiority of rural areas by analysing the results of teachers' surveys. Onyechi and Ugwunnadi (2009) focused on rural students' breakfast habits and healthy eating opportunities as advantages.

In this study, the advantages that rural education provides to the education process were compiled from the research in the literature. The advantages of rural education were categorised under the themes of healthy environment and nutrition opportunities, local community values, strong social function of the school, teachers being active in the local role, low number of students per teacher, and rich concrete experiences. Two studies, Alspaugh (1992) as cited in Kaplan (2010) and Kearney (1994), were found to compile the advantages of rural education. Since our study covers more recent research, its findings diversify the advantages of rural education. In addition, the fact that it also includes the suggestions presented in the literature for utilising the advantages of rural education is a different aspect of our study.

Studies on the advantages of rural education have increased after 2010. Although master's and doctoral theses increased after 2005, most of the relevant studies are articles. The advantages of rural education were mainly analysed through qualitative studies. The fact that the definition of rural differs across countries significantly differentiates the processes and findings of the studies and reduces their empirical generalisability. Although quantitative studies provide data from more participants, the data obtained are insufficient in determining the details of learning-teaching processes. Master's and doctoral theses, which are more long-term than articles, can be conducted by using qualitative and quantitative methods together.

While investigating the advantages of rural education, it is seen that teachers and students are mostly selected as the study group. Since students constitute crowded groups, quantitative methods were preferred to collect data. More qualitative studies were conducted with teachers. It can be said that this situation provided educators with more detailed data on rural education processes. When the distribution of the studies according to the advantages of rural education is analysed, it is seen that some of the advantages of rural education are expressed more frequently in the older studies conducted before 2005. Some of them are frequently mentioned in more recent studies and some of them are emphasised in both old and new studies. The advantages of rural education emphasised in older studies were related to the theme of the strong social function of the school and healthy environmental opportunities. The advantages of education in rural areas, which are frequently mentioned in current studies, are healthy nutrition opportunities, high environmental perception and visual perception scores, and lack of technology addiction.

The themes associated with the advantages of rural education, which were common in both old and current studies, were found to be local community values, teachers being active in the local role, low number of students per teacher and rich concrete experience. Accordingly, it can be stated that the majority of the advantages provided by rural education have been recognised since ancient times and that rural education has the power to provide new advantages as a result of the changing social structure.

It is seen that there is a consensus on suggestions for increasing the utilisation of the advantages of rural education. Another conclusion of our study is that the village institutes, as a successful example of rural education, can give direction to new and national rural education policies.

Recommendations

According to our findings, the following suggestions can be offered to our researchers:

- Qualitative studies aiming to determine the dynamics of our country regarding the advantages of rural education should be emphasised.

- Since theses can be conducted in a longer process than articles, qualitative and quantitative methods can be used together. Theses on the advantages of rural education should be encouraged since they will provide rich data.

- International literature should be followed, but care should be taken not to take educational practices directly without evaluating cultural differences.

Suggestions for determining education policies can be listed as follows:

- The different qualities of our rural regions in our country should be considered as a richness and educational contents should be differentiated according to the climate and needs of the regions. While determining the differences, the aim of raising citizens with a common consciousness and culture should be taken into consideration and basic culture courses should be preserved as common.

- The ability of schools in rural areas to be self-sufficient by creating their own resources should be taken into consideration and rural schools should be invested in this direction.

- Research on rural education should be supported.

- The results of research analysing rural education should be used in determining educational policies.

- Teachers who will work in rural areas should be trained as solution-oriented education specialists who are prepared for rural conditions before they start their service.

- Co-operation among rural teachers and in-service trainings for teachers should be increased.

- More experienced teachers should also be assigned to rural areas. Thus, increased professional sharing will support new teachers.

- It can be stated that it is the most important requirement for our educators working in rural areas to be aware of the advantages provided by rural areas.

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