The studies conducted regarding virtual museum area:
A content analysis research

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Abstract

Content analysis is a research method that has been widely used in the education area. This method is used to determine the presence of certain words or concepts within texts or sets of texts. In this study, it is aimed to analyse the research trends based on the studies conducted on the subject of virtual museums between 2014 and 2017. The study was carried out with content analysis research method and the sample was limited to 60 articles, which were analysed after searching the Taylor and Francis and Scopus databases for relevant articles. The articles, which was selected, were elicited according to six criteria, containing year of research, research type, research method, data collection methods, sample and subject of the research. As a result of the the study, it was established that the year in which the most amount of research studies was conducted was 2016.

Keywords: Virtual museum, content analysis, Tyler & Francis and Scopus databases.

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1. Introduction

Informative and communicative technologies are believed to have an important role in adapting to the changes in education (Bolat, 2016; Granito & Chernobilsky, 2012). In parallel to this belief, it is stated in the literature that the use of these informative and communicative technologies is increasing and that they can be effective in forming active teaching environments (Kara, 2016; Pekdag, 2010; Vosinakis & Tsakonas, 2016). In addition to this, when accompanied by innovative education approaches, the usability of education technologies offers an effective learning output in teaching process (Bond, Marin, Dolch, Bedenlier & Richter, 2018; Laurillard, Kenedy, Charlton, Wild & Dimakopoulos, 2018; Michos, Leo & Albo, 2018; Saritepeci, Durak & Seferoglu, 2016). Thus, virtual museums present themselves as an important technological environment, increasing the productiveness of education. Based on their increased usage in recent years, virtual museums are believed to have an important role in both forming interactive communication with the learner and ensuring permanent learning (Karatas, Yilmaz, Kapanoglu & Mericelli 2016; Kiourt, Koutsoudis, Markantonatou & Pavlidis 2016; Pivec & Kronberger, 2016; Zhao, 2012). According to Aladag, Akkaya and Sensoz (2014); Bozkus (2014); Caliskan, Onal and Yazici (2016); Kiourt et al. (2016) ve Kluge and Riley' (2008), virtual museum environments facilitate the promotion of cultural heritage of communities and also can provide easy access to international museum platforms. It is also mentioned that virtual museum applications offer learner-centred teaching, allowing the individual to learn by doing and experiencing (Sookhanaphibarn & Thawonmas, 2009). Virtual museums, which provide easy access by eliminating the concepts of time and location, are thought to enrich the learning process in each class and can increase motivation (Bozkus, 2014; Eguz & Kesten, 2012). It is stated that high-level thinking skills such as observing, analysing, synthesising and creative thinking can be developed with the activities which was carried out in virtual museum environments. In addition, the virtual museum provides the development of aesthetic sensitivity to the works exhibited in the museum (Akman, Altinkaynak, Ozen, Erturk Kara & Gul Can, 2015).

The literature review shows that virtual museums, which transform classes into a more enjoyable and active environment, are becoming an important subject for research. For example, in the studies by Alawad, Aljoufie, Tiwari and Daghestani (2015) and Kalinci (2015), attempts were made to identify the effects of virtual museums on students. In the studies of Bozkus (2014) and Can (2015), the importance of virtual museums was stated. In the research by Kampouropoulou, Fokiali, Efstathiou, Koutris and Stefos (2015) and Tengku, Ashaari and Rahim (2016), the efficiency of virtual museums was assessed in accordance with the students' opinions. In addition, when the literature is examined, it was revealed that most research studies are regarding the importance of virtual museums, evaluation of virtual museum trips according to teachers' opinions, examining the opinions and attitudes of social studies teachers about history and cultural heritage education, and evaluating the opinions of social studies teachers about their out-of-class learning (Aladag et al., 2014; Avci & Oner, 2015; Avci & Memisoglu 2016; Cengelci, 2013; Karatas, et al., 2016; Meydan & Akkus, 2014; Yildirim & Tahiroglu, 2012; Yilmaz & Seker, 2011). However, in contradiction, no content analysis-based research has been found that identifies the inclinations of virtual museums. Thus, performing a content analysis study on virtual museums in order to remedy the deficiency in the literature and to identify the inclinations of related-studies is believed to be beneficial.

Accordingly, in this research, virtual museum-related articles published between 2014 and 2017 in the Taylor and Francis and Scopus databases have been examined, based on content analysis. The aim of this research is to determine the inclinations of virtual museum-based research. Thus, the following questions were attempted to be answered.

- What are the findings related to the studies' introduction sections?
- What are the general aims of virtual museum-related research?
- What is the distribution of research methods utilised in virtual museum-related research?
- What are the methods used in virtual museum-related studies?
- What is the distribution of data gathering tools used in virtual museum-related studies?

2. Methodology

This research was conducted using the document review method used in qualitative research. The research studies in question were examined according to certain scales and evaluated by the content analysis method.

2.1. Data collection and analysis

With the aim of determining the inclinations of virtual museum-related studies, 60 articles published between the years of 2014 and 2017 in the Taylor & Francis and Scopus databases were examined. During the determination process of the studies to be included in this research, 'criterion sampling method', a purposive sampling method, was used. Thus, the criteria of this research studies are as follows: 'introduction', 'research aim', 'research type', 'research method' and 'data collection type'.

In the first stage of the content analysis, the topics were determined, research questions were prepared and the articles to be included were selected. The chosen articles were examined accordingly. The articles were coded in Microsoft Excel as A1, A2, A3 … A60 and were analysed in accordance with the scales. In the final stage, the findings were reported.

3. Results

In the research, 60 studies conducted between 2014 and 2017 and published in the Taylor and Francis and Scopus databases were found. In this section, the results of the aim-oriented analysis are tabulated and interpreted according to the chosen scales.

3.1. Findings related to the introduction section of the researches in the virtual museum field

The findings related to the introduction sections of the studies in the virtual museum field are presented in Table 1. When the data in Table 1 are examined, it can be seen that the problem status is interpreted according to the aim of the research. In addition, it has been determined that only a minority of studies only partially explained the problem status. It has also been observed that the majority of the research studies do not clearly explain the importance behind the studies and a limited number of studies only partially make reference.

Table 1. Findings related to the introduction section of the article in the virtual museum field

Introduction Section Related Data		f
The problem state (in accordance with the research's aim)…	was explained	46
	was partially explained	14
Importance of the Research…	was explained	22
	was partially explained	38

3.2. Findings related to the aims of virtual museum field related research

The findings related to the aims of the virtual museum field-related studies have been presented in Table 2. According to these findings, the majority of the studies were conducted with the aim of determining the effect of virtual museums in art education.

Table 2. Findings related to the aims of virtual museum field-related studies

Research Aims	f
Effect of virtual museums on art education	13
Students' opinions on the use of virtual museums in teaching	12
Teachers' opinions on the use of virtual museums in teaching	9
Effect of virtual museums on the students' success	8
Effect of virtual museums in science education	7
Effect of virtual museums in history education	5
Effects of the utilisation of Virtual Reality in virtual museums	5
Effect of virtual museums in archaeology education	3

It can be observed that the studies aiming to determine the students' opinions on the use of virtual museums are in the majority. In addition, it is perceived that the studies aim to determine the teachers' opinions on the use of virtual museums, the effects of virtual museums on the students' success and the resultant effects on science education. Despite their deficient numbers, the existence of articles aiming to identify the effects of virtual museums on history education and the efficiency of the utilisation of virtual reality has been established. It has been detected that several studies have also focused on determining the effects of virtual museums in archaeology education.

3.3. Findings related to the research types in the virtual museum field

The findings related to the research types in the virtual museum field have been presented in Table 3. As a result of the content analysis, it has been determined that, in the majority of the conducted studies, the qualitative method was preferred. In addition, the quantitative research method was also included in several studies. The least utilised method was determined to be the mixed method.

Table 3. Findings related to the research types on the virtual museum field

Research Type	f
Qualitative	32
Quantitative	24
Mix	3

3.4. Findings related to the research methods used in studies on the virtual museum field

The findings related to the research methods used in the studies on the virtual museum field have been presented in Table 4. It has been determined that, in the majority of the conducted studies, the experimental method was utilised. In addition, the scanning method was frequently preferred. Literature review and case study methods were observed to be used, although less frequently. The gathered findings suggest that the interview method was the least preferred.

Table 4. Findings related to the research methods used in studies on the virtual museum field

Research Method	f
Experimental Study	18
Scanning	16
Literature Review	11
Case Study	9
Interview	6

3.5. Findings related to the data gathering tools used in virtual museum research

The findings related to the data gathering tools used in the virtual museum studies have been presented in Table 5. The gathered data shows that the most frequently used tool was the achievement test. In addition, the document review was determined as a frequently preferred method. Surveys and interview forms combined with observation were also tools deemed to be important. Scales and interview forms were also used as data gathering tools during the research studies. It has been observed that there were only a limited number of articles that included a combination of achievement tests and observations. Only a minority of studies included a combination of achievement tests and interview forms.

Table 5. Findings related to the data gathering tools used in the virtual museum studies

Data Collection Method	f
Achievement Test	14
Document Review	11
Survey	9
Interview form – Observation	8
Scale	7
Interview Form	7
Achievement Test – Observation	3
Achievement Test – Interview Form	1

4. Discussion and conclusion

As a result of the content analysis that focused on the research studies in the virtual museum field, it was found that the problem status in the relevant studies was generally formulated in accordance with the studies' aims; however, information on the importance of the research was not sufficiently explained in most of the cases. As Karasar's (2008) research identified, a clear explanation of the problem status can have an intensifying effect on the validity of a study. The findings of this research suggest that the majority of the studies conducted on virtual museums lack sufficient explanations on the problem status. Despite this result, it is also believed that a partial explanation of the importance of this field can still have an impact on the reliability and validity of the research into the subject (Walliman, 2011).

In the majority of the studies on the virtual museum field, attempts were made to identify the effects of virtual museums on art education. Furthermore, it was found that that the effect of virtual museums on archaeology education was the least preferred subject in these studies. In Kizilay and Dogan's (2014) research, it was stated that the effect of virtual museums on archaeology education can be increased by its utilisation in the class environment. This finding indicates the necessity for increasing the number of studies that focus on the relationship between virtual museums and archaeology education.

In addition, it was observed that the majority of the studies in this field were comprised of qualitative research, while only a minority were quantitative. The literature shows that in the studies, the mixed method was more frequently used and this method was more effective at increasing the reliability and validity of the material (Azorin & Cameron, 2010). In this regard, it is believed that utilising a mixed method in virtual museum field-related studies can be beneficial for increasing the reliability and validity of such research.

Moreover, the most frequently used method in virtual museum field-related studies was found to be the experimental method, while the least common method was the use of interviews. The experimental method is believed to provide opportunities for practical activities in this field. Thus, the

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cause–effect relationship can be more clearly revealed in such research (Cohen, Manion & Morrison, 2007). When considering the importance of the experimental method in evaluating the opinions on the subject, this method is believed to be more effective in clarifying the opinions on the activities included in the virtual museum field (Eguz & Kesten, 2012).

The most frequently preferred data gathering tool in the virtual museum field-related studies was found to be the achievement test. However, the use of achievement tests with interview forms was found to be limited. As the majority of studies were conducted with the experimental method, the achievement tests were chosen as the most appropriate data gathering tools. In this context, the use of achievement tests with different methods is believed to increase the variety and validity of the research being conducted (Williams, 2007).

In conclusion, content analysis conducted in this study has attempted to determine the current inclinations of the studies focusing on the virtual museum field. Accordingly, it can be said that the lack of studies in the field clearly reveals the importance of increasing the number of research articles on this subject. It is also suggested that more research should be implemented using the mixed method, along with studies that include multiple methods and data gathering tools, in order to increase their validity and reliability.

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References

Akman, B., Altinkaynak Ozen, S., Erturk Kara, G. H. & Gul Can, S. (2015). The views of preschool teachers on museum education. *Uludag University Journal of The Faculty of Education*, *28*(1), 97–115.

Aladag, E., Akkaya, D. & Sensoz, G. (2014). Evaluation of using virtual museums in social studies lessons according to teacher's view. *Trakya University Journal of Social Science*, *16*(2), 199–217.

Alawad, A., Aljoufie, M., Tiwari, A. & Daghestani, L. (2015). Beyond geographical and cultural barriers: the concept of a virtual gallery for arts, design & architecture schools in Saudi Arabia. *Art and Design Review*, *3*, 87–93.

Avci, C. & Oner, G. (2015). Teaching with historic places social studies: social studies teachers' views and recommendations. *Abant Izzet Baysal University Journal of Education Faculty*, *15*(I), 108–133.

Avci, M. & Memisoglu, H. (2016). Views of social studies teachers about the cultural heritage education. *Elementary Education Online*, *15*(1), 104–124.

Azorin, J. M. & Cameron, R. (2010). The application of mixed methods in organizational research: a literature review. *Electronic Journal of Business Research Methods*, *8*(2), 95.

Bolat, Y. (2016). The flipped classes and education information network (EIN). *Journal of Human Sciences*, *13*(2), 3373–3388.

Bond, M., Marin, V. I., Dolch, C., Bedenlier, S. & Richter, O. Z. (2018). Digital transformation in German higher education: student and teacher perceptions and usage of digital media. *International Journal of Educational Technology in Higher Education*, *15*(48), 1–20.

Bozkus, B. S. (2014). The development of virtual museums in Turkey: as perspective of culture and art communication. *International Journal of Social Science, 26*, 329–344.

Caliskan, E., Onal, N. & Yazici, K. (2016). What do social studies pre-service teachers think about virtual museums for instructional activities. *International Periodical for the Languages*, *Literature and History of Turkish or Turkic*, *11*(3), 689–706.

Can, M. (2015). The effects of modern museology in handcrafts education in process of globalization. *The Journal of Turk & Islam World Social Studies, 2*(5), 85–92.

Cengelci, T. (2013). Social studies teachers' views on learning outside the classroom. *Educational Sciences: Theory & Practice*, *13*(3), 1823–1841.

Islek, D. & Asiksoy, G. (2019). The studies conducted regarding virtual museum area: A content analysis research. *World Journal on Educational Technology: Current Issues*. *11*(1), 87–93.

Cohen, L., Manion, L. & Morrison, K. (2007). *Research methods in education*. London; New York: Routledge.

Eguz, S. & Kesten, A. (2012). Teachers and students' opinions regarding learning with museum in social studies course: case of Samsun. *Inonu University Journal of The Faculty of Education*, *13*(1), 81–103.

Granito. M. & Chernobilsky, E. (2012). The effect of technology on a student's motivation and knowledge retention. *NERA Conference Proceedings*, *17*, 1–22.

Kalinci, E. (2015). An analysis of virtual museum which provides 360 degree panoramic image in terms of graphic design. *The Turkish Online Journal of Design*, *5*(4), 57–65.

Kampouropoulou, M., Fokiali, P., Efstathiou, I., Koutris, T. & Stefos, E. (2015). Students' views on the use of a virtual educational museum. *Review of European Studies*, *7*(11), 1–6.

Kara, C. O. (2016). Flipped classroom. *Medical Education*, *45*, 12–26.

Karasar, N. (2008). *Research methods*. Ankara, Turkey: Nobel.

Karatas, S., Yilmaz, A., Kapanoglu, G. & Mericelli, M. (2016). An investigation of teachers' opinions about virtual museums. *Journal of Research in Education and Teaching*, *5*(1), 112–125.

Kiourt, C., Koutsoudis, A., Markantonatou, S. & Pavlidis, G. (2016). The 'synthesis' virtual museum. *Mediterranean Archaeology and Archaeometry, 16*(5), 1–9.

Kizilay, N. & Dogan, Y. (2014). Archeology in classroom: an action research upon developing the historical thinking skills of 6th grade students. *Firat University Journal of Social Science*, *24*(2), 85–107.

Kluge, S. & Riley, L. (2008). Teaching in virtual worlds: opportunities and challenges. *Issues in Informing Science and Information Technology*, *5*, 127–135.

Laurillard, D., Kenedy, E., Charlton, P., Wild, J. & Dimakopoulos, D. (2018). Using technology to develop teachers as designers of TEL: evaluating the learning designer. *British Journal of Educational Technology*, *49*(6), 1044–1058.

Meydan, A. & Akkus, A. (2014). The importance of getting students adopt the historical and cultural values through museum visits in social studies teaching. *Marmara Geographical Review*, *4*(13), 13–30.

Michos, K., Leo, H. D. & Albo, L. (2018). Teacher-led inquiry in technology-supported school communities. *British Journal of Educational Technology*, *49*(6), 1077–1095.

Pekdag, B. (2010). Alternative methods in chemistry learning: learning with animation, simulation, video and multimedia. *Journal of Turkish Science Education*, *7*(2), 79–110.

Pivec, M. & Kronberger, A. (2016). Virtual museum: playful visitor experience in the real and virtual world. *IEEE*, *1*, 1–4.

Saritepeci, M., Durak, H. & Seferoglu, S. (2016). Examination of teachers' in-service training needs in the field of instructional technology: an evaluation in light of applications implemented at FATIH project. *Turkish Journal of Computer and Mathematics Education*, *7*(3), 601–620.

Sookhanaphibarn, K. & Thawonmas R. (2009). A movement data analysis and synthesis tool for museum visitors' behaviors. In P. Muneesawang, F. Wu, I. Kumazawa, A. Roeksabutr, M. Liao & X. Tang. (eds.) *Advances in Multimedia Information Processing – PCM* (vol 5879, pp. 144–154).

Tengku, W. T. S. M., Ashaari, N. S. & Rahim, N. (2016). Designing multi-dimensional user interaction for a virtual museum system. *Journal of Electrical Engineering and Computer Science*, *4*(3), 649–654.

Vosinakis, S. & Tsakonas, Y. (2016). Visitor experience in Google art project and in second life-based virtual museums: a comparative study. *Mediterranean Archaeology and Archaeometry*, *16*(5), 19–27.

Walliman, N. (2011). *Research methods: the basic*. London; New York: Routledge.

Williams, C. (2007). Research methods. *Journal of Business & Economic Research*, *5*(3), 65–72.

Yildirim, T. & Tahiroglu, M. (2012). The effects of virtual museum visits on elementary students' attitudes towards social studies courses. *Electronic Journal of Social Sciences*, *11*(39), 104–114.

Yilmaz, K. & Seker, M. (2011). The analysis of the views of primary school students on visiting museums and teaching museums in social studies. *The Journal of Science Istanbul Aydin University*, *1*(3), 21–39.

Zhao, J. (2012). Designing virtual museum using web 3D technology. *Physics Procedia, 33,* 1596–1602.