(ISSN: 2602-4047)

Akdağ, S. (2025). The Opinions Of Social Studies Teacher Candidates On Preparing Educational Comics Using Web 2.0 Tools, *International Journal of Eurasian Education and Culture , 10(30), 301-313.*
DOI: http://dx.doi.org/10.35826/ijoecc.2877

Article Type: Research Artıcle

THE OPINIONS OF SOCIAL STUDIES TEACHER CANDIDATES ON PREPARING EDUCATIONAL COMICS USING WEB 2.0 TOOLS

Sinan AKDAĞ
Assist Prof, Atatürk Universty, Erzurum, Turkey, sinan.akdag@atauni.edu.tr
ORCID: 0000-0001-5106-7289

Received: 29.05.2025 *Accepted: 19.08.2025* *Published: 15.09.2025*

ABSTRACT

This study explores the opinions of Social Studies teacher candidates on the process of designing and using educational comics through Web 2.0 tools, specifically Canva and Pixton. Conducted with 35 senior students enrolled in the Social Studies Teaching Department at Atatürk University during the 2024–2025 academic year, the research adopts a basic qualitative design to capture participants' experiences and perceptions. Data were collected through a semi-structured interview form consisting of four open-ended questions, which allowed for in-depth exploration of both the strengths and limitations of employing digital tools for comic creation. The collected data were analyzed via content analysis, leading to the emergence of three central themes: positive aspects, negative aspects, and the impact on skill development. Findings revealed that participants predominantly viewed the integration of Web 2.0 tools into comic production as beneficial for enhancing creativity, visualization, multidimensional thinking, scenario building, and technological proficiency. In addition, educational comics were found to support both cognitive and affective learning by making abstract concepts concrete, sustaining student motivation, and contributing to long-term knowledge retention. Conversely, certain challenges were also reported, including the limited accessibility of paid software features, difficulties in applying comics to every subject area, lack of sufficient computer literacy among some candidates, and the time-consuming nature of the process. Despite these drawbacks, the study highlights that the use of educational comics significantly contributed to the development of critical skills such as creative and reflective thinking, empathy, digital literacy, and planning. Overall, the research underscores the pedagogical potential of educational comics as innovative instructional materials within teacher education, while also drawing attention to practical barriers that must be addressed for more effective integration. Recommendations include the provision of structured training programs, institutional support for access to educational licenses, and guidance on ergonomic technology use to maximize the efficiency and sustainability of such practices.

Keywords: Social studies teacher candidate, educational comic, Web 2.0 tools

Corresponded Author: Assist Prof, Sinan Akdağ , Atatürk University, sinan.akdag@atauni.edu.tr
Ethics Committee Approval: Atatürk Universty, 05/02/2025 and -56785782-050.02.04-2500048228
Plagiarism/Ethics: This article has been reviewed by at least two referees and has been confirmed to comply with research and publication ethics, containing no plagiarism.

INTRODUCTION

As technology continues to evolve, its impact on education and the teaching process becomes inevitable. Thanks to technological advancements, new-generation tools have begun to replace traditional methods in educational settings, gradually bringing updates to teaching practices. One such tool is undoubtedly Web 2.0. These tools enhance the learning experience by providing students at all educational levels with diverse content, positively influencing the learning process (Eser, 2020). Web 2.0 tools play a crucial role in fostering positive behaviors such as effective learning, active participation, interaction, engagement, motivation, responsibility, and creativity (Borich, 2017; Ajjan & Hartshorne, 2008; Adcock & Bolick, 2011; Palaigeorgiou & Grammatikopoulou, 2016; Murphy & Lebans, 2008). Materials created with these tools allow pre-service teachers or students at various educational levels to engage with lessons through multiple senses, leading to more lasting learning (Kaya, 2005; Yalın, 2007). In order to achieve lasting learning, visual and auditory aids (such as graphics, photos, concept maps, slides, films, and screen captures from computers and televisions) are essential (Düzgün, 2000). One type of material that can fulfill this need is educational comics. Comic books serve as effective tools in education by encouraging students' active participation in the learning process. By combining visual and textual elements, they present information in a multimodal format, which is particularly beneficial for visual learners. Additionally, they help to concretize abstract concepts, making complex topics easier for students to understand (Frey & Fisher, 2008). Their narrative structure supports the development of empathy, critical thinking, and social skills. Comic books also play a significant role in fostering reading habits, offering an engaging and accessible alternative especially for students with low motivation or reading difficulties (Versaci, 2007). In this respect, comic books function as versatile educational resources that support both cognitive and affective domains of learning.

For comics to be used effectively in education, they must be compatible with the visual, emotional, and cognitive levels of the target audience. Educational comics, with their colorful visuals and humorous elements, are effective in capturing students' attention and can be easily incorporated into lessons. When used effectively in education, humor and its elements can help students learn, stay motivated, engage with the course, and retain the information they learn (Altunay, 2022). The main advantage of using comics in education is their ability to significantly increase student motivation (Topkaya, 2014). A review of existing literature shows that there is limited research on Social Studies teacher candidates' views regarding the creation of comics using Web 2.0 tools (Mutlu, 2019; Tünkler, 2021; Yıldırım, 2016; Leylak & Say, 2023; Şin, 2022; Kaya, Tokcan & Çam, 2023; Hosler & Boomer, 2011; Akdağ & Şimşek, 2023; Orçan, 2013; Jones & Woglom, 2013; Beard & Rhodes, 2002; Brocka, 1979; Çetin, 2010; Haugaard, 1973; Hutchinson, 1949; Muniran & Yusof, 2008; Olson, 2008; Özdemir, 2010; Rota & Izquierdo, 2003; Sones, 1944; Song et al., 2008; Topkaya, 2014; Topkaya, 2016; Topkaya & Şimşek, 2015; Topkaya & Yılar, 2015; Trent & Kinlaw, 1979; Williams, 1995). However, exploring teacher candidates' perspectives on creating comics with Web 2.0 tools and identifying their strengths and weaknesses is crucial, as it could provide valuable insights for guiding similar studies in the future.

In the educational process, not only is using comics as a teaching material important, but following the steps involved in creating them is equally significant. In this study, two Web 2.0 tools, Canva and Pixton, which allow the creation of comics, were introduced to Social Studies teacher candidates. The candidates received training on how to use these tools and were asked to produce comics. During this process, interviews were conducted with the teacher candidates to gather their opinions on comics.

METHOD

Research Design

This study used a qualitative research approach, which aims to understand how individuals interpret their experiences. Data was collected through interviews, observations, and documents (Merriam, 2009). The method was chosen because the focus was on Social Studies teacher candidates' experiences and opinions regarding the

process of creating comics with Web 2.0 tools. Qualitative research aims to uncover individuals' thoughts and perceptions about a particular event or situation using various techniques (Yıldırım & Şimşek, 2018). These types of studies are usually conducted with smaller sample groups to allow for in-depth examination of perceptions related to a problem (Creswell, 2013).

Data Collectıon Tools

In the present study, a semi-structured interview form comprising four questions was employed as the primary data collection instrument. This tool was designed to elicit Social Studies teacher candidates' perceptions, experiences, and attitudes regarding the utilization of Web 2.0 tools in the comic creation process. The semi-structured nature of the instrument enabled participants to articulate their perspectives comprehensively, while affording the researcher the flexibility to pose supplementary questions based on participants' responses. The development of the interview form entailed a rigorous, multi-phase process to ensure its validity and alignment with the study's objectives. Initially, an exhaustive review of relevant literature was undertaken to identify salient themes concerning the use of Web 2.0 tools in comic production and the associated perceptions of teacher candidates. Subsequently, a preliminary set of open-ended questions was formulated to explore both the positive and negative experiences, as well as the cognitive and affective effects of these digital tools. This draft was subjected to expert evaluation by specialists in educational technology and qualitative research methodologies, whose feedback facilitated refinement in terms of clarity, focus, and relevance. Furthermore, pilot interviews were conducted with a purposive sample of teacher candidates exhibiting characteristics analogous to those of the main study population. This pilot phase served to identify ambiguities and enhance the coherence and comprehensibility of the instrument. Through this iterative process, a robust and effective semi-structured interview form was finalized, capable of eliciting in-depth data concerning teacher candidates' views on the employment of Web 2.0 tools in comic creation.

Study Group

The participants of the study consisted of 35 fourth-year Social Studies teacher candidates enrolled in the Department of Social Studies Education at Atatürk University's Kazım Karabekir Faculty of Education during the fall semester of the 2024-2025 academic year. Convenience sampling was used in this study, as the participants were selected from among those who were easily accessible to the researcher and willing to participate. The participants underwent a three-week training on the use of two Web 2.0 tools, Canva and Pixton, aimed at creating educational comics. After completing the training, the teacher candidates were asked to create comics using these tools based on predefined topics and learning objectives.

Process

In the study, a comprehensive training program was implemented for Social Studies teacher candidates on developing comic materials using Web 2.0 tools. At the outset of the process, orientation sessions were held to introduce the participants and prepare them for the training. Over the following three weeks, a total of 12 hours of theoretical and practical training was provided, consisting of four hours per week. In the initial phase of the program, detailed theoretical knowledge about comic creation software such as Pixton and Canva was delivered. Following these theoretical sessions, the teacher candidates engaged in hands-on activities in the computer lab, where they had the opportunity to apply their knowledge directly using Web 2.0 tools. Each participant was given the opportunity to design comics utilizing these tools throughout the duration of the training. Upon completion of the training program, comprehensive discussions were conducted to evaluate the teacher candidates' experiences, opinions, and suggestions regarding the three-week application period.

Data Analysis

The data collected through the semi-structured interview form were analyzed using content analysis, a widely accepted and frequently employed method in qualitative research. Content analysis facilitates the systematic examination and interpretation of textual data, enabling researchers to identify patterns, themes, and categories within the data. It serves as a rigorous tool for describing phenomena and converting qualitative information into structured, often quantifiable, formats, thereby enhancing the clarity and comprehensibility of the findings (Krippendorff, 2012). This analytical approach allows for both inductive and deductive strategies depending on the research goals. Through the inductive process, themes and categories emerge organically from the raw data without imposing preconceived frameworks, whereas the deductive process applies existing theoretical constructs to guide the coding and interpretation of data. Consequently, content analysis not only supports a systematic organization of data but also provides a means for deepening understanding and facilitating the verification or refinement of theoretical perspectives (Elo & Kyngäs, 2008). Employing this method in the present study ensured a robust and credible examination of the teacher candidates' responses, thereby contributing significantly to the validity and reliability of the research findings.

Ethics Committee Approval: Atatürk Universty, 05/02/2025 and -56785782-050.02.04-2500048228

FINDINGS

To explore the views of teacher candidates who created educational comics using Web 2.0 tools, the participants were asked questions from the interview form and were requested to provide answers. Based on the responses, several codes were developed to categorize the data. From the interviews, the main theme "Creating Educational Comics with Web 2.0 Tools" emerged. Under this theme, three sub-themes were identified: positive aspects, negative aspects, and the impact on skills. Since participants provided multiple responses to the questions, the number of categories is greater than the number of participants.

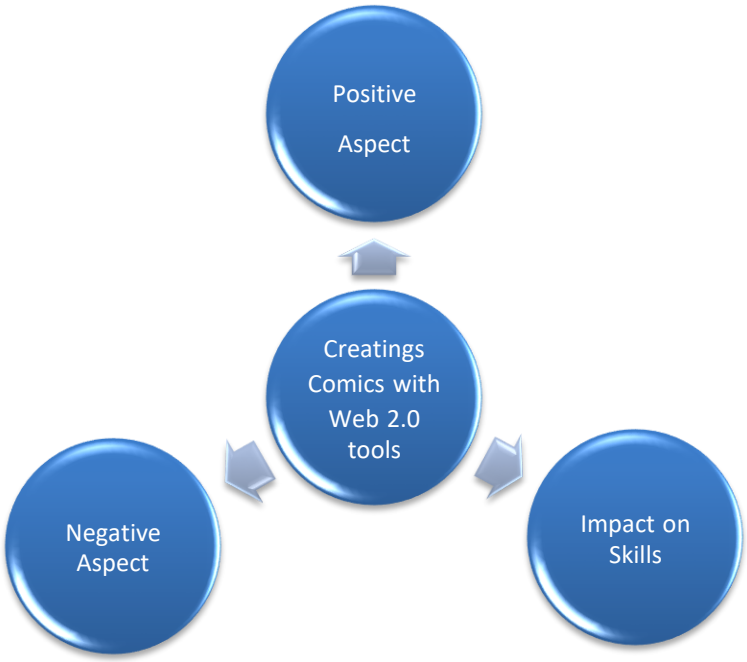

Figure 1. Creating Comics with Web 2.0 Tools

Findings on the positive aspects of creating comics with Web 2.0 Tools

The codes related to the sub-theme "Positive Views," which emerged from the teacher candidates' experiences in creating educational comics with Web 2.0 tools, are presented in Table 1. Below are direct quotes from the teacher candidates that contributed to the development of this sub-theme and its corresponding codes.

Table 1. Positive Views on Creating Comics with Web 2.0 Tools

Subtheme	Codes	Frequency
Positive Views	Improving scriptwriting	11
	Ability to design and plan visuals	11
	Developing imagination	10
	Ability to turn the topic into a story	10
	Improving computer usage	9
	Visualizing the topic	9
	Improving visual intelligence	9
	Promoting technological development	8
	Ensuring permanence	8
	Developing multi-dimensional thinking	7
	Making abstract concepts concrete	7
	Making learning enjoyable	6

Table 1 presents the positive aspects of the comics created with the help of Web 2.0 tools, as seen from the teacher candidates' perspectives. The most frequently mentioned contributions in the table were the improvement of scriptwriting and the ability to design and plan visuals. Other codes expressed by the teacher candidates include enhancing imagination, turning a topic into a narrative, improving computer skills, visualizing topics, developing visual intelligence, promoting technological progress, ensuring retention, and fostering multi-dimensional thinking. Below are some examples of positive views on the comics created using Web 2.0 tools, based on the direct statements of the teacher candidates:

Student 1: "By creating comics using Web 2.0 tools, we learned how to imagine and develop scenarios."

Student 2: "Programs like Pixton and Canva helped improve our visual intelligence, and we were able to visualize the topics given to us."

Student 3: "Our computer skills increased as we used the necessary tools to work with these programs."

Student 4: "The topics of the comics we created using these tools became more memorable, and not only did we have fun, but we also learned to think from multiple perspectives, looking at issues in different ways."

Findings on the negative aspects of creating comics with Web 2.0 Tools

The "Negative Views" sub-theme, derived from the teacher candidates' experiences in creating educational comics using Web 2.0 tools, is presented in Table 2. The direct quotes from the teacher candidates that contributed to the formation of this sub-theme and its codes are provided below.

Table 2. Negative Views on Creating Comics with Web 2.0 Tools

Subtheme	Codes	Frequency
Negative Views	I don't think it has a negative impact	15
	The programs being paid	4
	Not being suitable for every topic	3
	Not everyone knowing how to use a computer	2
	Creating an incorrect scenario	2
	Making it difficult to convey topics in depth	2
	Making it difficult to distinguish between reality and the scenario	2
	Causing vision and posture problems	2
	The failure to convey the intended message accurately	2
	It requires a lot of effort	1
	Taking up a lot of time	1

Table 2 outlines the negative aspects of the comics created with the help of Web 2.0 tools from the perspective of teacher candidates. Most of the candidates reported that they did not encounter any significant issues. The most frequently mentioned problem was that the programs are paid. In addition, challenges such as difficulties in using the programs, technological skill gaps, time consumption, and the need for a lot of effort were also identified. The direct quotes from the teacher candidates that contributed to the development of this sub-theme and its codes are as follows:

Student 1: "Since Pixton and Canva are paid programs, we can't do everything we want."

Student 2: "These programs are great for creating comics, but they can't provide tailored content for every topic."

Student 3: "For those who don't know how to use a computer, it can be quite difficult and time-consuming."

Student 4: "Spending too much time in front of the computer can lead to vision and posture problems, causing energy and time loss."

Findings on the impact of creating comics with Web 2.0 Tools on skills

The codes related to the sub-theme "Impact on Skills," derived from teacher candidates' experiences in creating educational comics with Web 2.0 tools, are presented in Table 3**.** Direct quotes from the teacher candidates that contributed to the development of this sub-theme and its corresponding codes are provided below.

Table 3. The Impact of Creating Comics with Web 2.0 Tools on Skills

Subtheme	Codes	Frequency
Impact on Skills	Developing creative thinking skills	20
	Developing visual perception skills	19
	Developing imagination skills	19
	Developing the ability to use information Technologies	18
	Developing empathy skills	14
	Developing the ability to think multidimensionally	14
	Developing social learning skills	13
	Developing planning and organization skills	12
	Developing socialization skills	11
	Developing reflective thinking skills	11

Table 3 highlights the skills developed by teacher candidates through the creation of comics using Web 2.0 tools. Most of the teacher candidates reported enhancing their creative thinking skills. They also mentioned improvements in skills such as visual perception, imagination, and using information technologies. Below are direct quotes from the teacher candidates that contributed to the formation of this sub-theme and its corresponding codes:

Student 1: "Through the work we did on creating scenarios using the programs our instructor taught us, we realized that our creative thinking skills have improved."

Student 2: "We had to add visuals to the stories we created. At first, it was challenging to choose the right visuals from hundreds of options. Over time, selecting visuals that suited our stories became easier."

Student 3: "The programs we used for creating comics provided us with visual resources, but writing the story was up to us. This required us to use our imagination to come up with different scenarios related to the given topics."

Student 4: "Thanks to these programs, we started using the computer more efficiently. We learned to work in a planned and organized way, designing and visualizing our thoughts through a story."

CONCLUSION AND DISCUSSION

This section presents the results of the analysis of the data obtained from interviews conducted to reveal the views of social studies teacher candidates on creating comics using Web 2.0 tools. After analyzing the data, the findings are interpreted and presented.

The first question posed to the teacher candidates during the interview was, “What are the positive aspects of creating comics with Web 2.0 tools?” The teacher candidates reported that creating comics with Web 2.0 tools positively impacted cognitive and affective learning, facilitated the visualization and communication of information, encouraged multidimensional thinking, helped in scenario creation, ensured meaningful and lasting learning, and promoted technological development. These findings align with previous research, which indicates that the use of Web 2.0 tools in educational settings has led to changes in the knowledge and skills of teacher candidates (Berkowitz and Packer, 2001; Jones and Woglom, 2013; Krusemark, 2016; Lazzarich, 2013; Richter, Rendigs, and Mamirinina, 2015; Upson and Hall, 2013; Weitkamp and Burnet, 2007; Çelik, 2020; Gursoy and Orhan Goksun, 2019; İzgi Onbaşılı, 2020; Hosler and Boomer, 2011; Tatlı, Akbulut, and Altınışık, 2016).

The second question asked to the teacher candidates during the interview was, “What are the negative aspects of creating comics with Web 2.0 tools?” The teacher candidates listed several issues, including the fact that the programs are paid, not suitable for every topic, the lack of computer skills among some users, the creation of incorrect scenarios, difficulty in conveying topics in-depth, making it hard to distinguish between reality and the scenario, causing visual and posture issues, failure to communicate the intended message clearly, the need for

excessive effort, and the time-consuming nature of the process. The participants suggested that these issues might have arisen because they were experiencing Web 2.0 tools for the first time. To overcome these challenges, offering various training sessions and improving the use of technological information systems could make the process more efficient. Other studies related to this topic have also pointed out issues such as insufficient technology use (İzgi Onbaşılı, 2020), language problems in applications (İzgi Onbaşılı, 2020; Tatlı, Akbulut, and Altınışık, 2019), access to advanced features only with paid memberships (Unal and Uzun, 2019), and lack of knowledge about these technologies (Pritchett, Pritchett, and Wohleb, 2013; Unal and Uzun, 2019; Coutinho, 2008; Gürsoy and Orhan Göksun, 2019) as factors negatively affecting the use of Web 2.0 tools.

The third question posed to the teacher candidates during the interview was, "What is the impact of creating comics with Web 2.0 tools on skills?" The teacher candidates expressed that the process helped them develop skills such as creative thinking, visual perception, imagination, information technology usage, empathy, multidimensional thinking, social learning, planning and organization, socialization, and reflective thinking. The results obtained align with findings from studies conducted by Zimmerman (2018), Davis, Bagozzi, and Warshaw (1989), Sadaf, Newby, and Ertmer (2013), Botkin (2014), Avcı and Yücel (2017), Alhassan (2017), Pan and Franklin (2011), and Ward (2015).

SUGGESTIONS

As a conclusion, based on the results of this study, the following recommendations can be made: Considering that many teacher candidates encountered Web 2.0 tools for the first time during the comic creation process, it is crucial to provide hands-on training aimed at improving their technical knowledge and digital competencies before engaging in such activities. The fact that many of these tools require paid subscriptions negatively affects their accessibility and frequency of use. Therefore, educational institutions should facilitate access to free or educationally licensed versions to support broader participation. Furthermore, since not every subject is equally suited to the comic format, teacher candidates should be guided to select content that aligns with pedagogical goals. The process has been found to foster skills such as creative thinking, scenario development, empathy, and multidimensional thinking. In this context, integrating creative and reflective practices into teacher education programs can enhance these competencies. However, the time-intensive and effort-demanding nature of comic creation highlights the need to support candidates in developing time management and organizational skills. Additionally, participants reported challenges related to visual complexity, unclear communication of ideas, and physical discomfort, such as poor posture. These issues point to the necessity of providing guidance on ergonomic and effective technology use. Finally, limitations such as language barriers within the tools and restricted access to advanced features due to paid subscriptions indicate a need for localization efforts and the development of more user-friendly, accessible interfaces. Collectively, these recommendations aim to promote more effective and widespread integration of Web 2.0 tools into educational practices.

REFERENCES

Adcock, L., & Bolick, C. (2011). Web 2.0 tools and the evolving pedagogy of teacher education. *Contemporary Issues in Technology and Teacher Education, 11*(2), 223–236.

Ajjan, H., & Hartshorne, R. (2008). Investigating faculty decisions to adopt Web 2.0 technologies: Theory and empirical tests. *The Internet and Higher Education, 11*(2), 71–80. https://doi.org/10.1016/j.iheduc.2008.01.003

Akdağ, S., & Şimşek, U. (2023). The effects of using educational comics on students' cognitive and affective learning in social studies course in distance education. *Ponte, 4*(79), 1–30.

Alhassan, R. (2017). Exploring the relationship between Web 2.0 tools self-efficacy and teachers' use of these tools in their teaching. *Journal of Education and Learning, 6*(4), 217–228.

Altunay, F. (2020). Sosyal bilgilerde mizah unsurları ve kullanımı. In Değirmenci, Y. & Kansu Çevik, C. (Eds.), İlkokullarda uygulama temelli sosyal bilgiler öğretimi (ss. 287–316). Nobel.

Avcı-Yücel, Ü. (2017). Perceptions of pedagogical formation students about Web 2.0 tools and educational practices. *Education and Information Technologies, 22*(4), 1571–1585.

Beard, C., & Rhodes, T. (2002). Experiential learning: Using comic strips as reflective tools in adult learning. *Australian Journal of Outdoor Education, 6*(2), 58–65.

Berkowitz, J., & Packer, T. (2001). Heroes in the classroom: Comic books in art education. *The Journal of Art Education, 54*(6), 12–18.

Borich, G. D. (2017). Effective teaching methods: Research-based applications (Trans. M. B. Acat). Ankara: Nobel Academic Publishing.

Botkin, M. A. (2014). Examining pre-service teacher field-based capstone experiences using Web 2.0 technology: Factors influencing intent, level of use, and ability. (Unpublished doctoral dissertation). University of Houston-Clear Lake.

Brocka, B. (1979). Comic books: In case you haven't noticed, they've changed. *Media and Methods, 15*(9), 30–32.

Coutinho, C. P. (2008). Web 2.0 tools in pre-service teacher education programs: An example from Portugal. In D. Remenyi (Ed.), *The proceedings of the 7th European conference on e-learning* (pp. 239–245). Academic Publishing Limited.

Creswell, J. W. (2013). *Qualitative inquiry & research design: Choosing among five approaches*. Sage.

Çelik, T. (2020). Training social studies teachers in the digital age: An action research. *Pamukkale University Journal of Social Sciences Institute, 38*, 211–229.

Çetin, Y. (2010). Teaching lines. *National Folklore, 85*, 193–198.

Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science, 35*(8), 982–1003.

Elo, S., & Kyngas, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing, 62*, 107–115. https://doi.org/10.1111/j.1365-2648.2007.04569.x

Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing*, *62*(1), 107–115. https://doi.org/10.1111/j.1365-2648.2007.04569.x

Eser, M. (2020). Investigation of pre-service teachers' self-efficacy beliefs in Web 2.0 rapid content development. *Journal of Teaching Technology and Lifelong Learning, 1*(1), 122–137.

Frey, N., & Fisher, D. (2008). *Teaching visual literacy: Using comic books, graphic novels, anime, cartoons, and more to develop comprehension and thinking skills*. Thousand Oaks, CA: Corwin Press.

Gursoy, G., & Orhan Goksun, D. (2019). The experiences of pre-service science teachers in educational content development using Web 2.0 tools. *Contemporary Educational Technology, 10*(4), 338–357.

Haugaard, K. (1973). Comic books: Conduits to culture? *Reading Teacher, 27*, 54–55.

Hosler, J., & Boomer, K. B. (2011). Are comic books an effective way to engage nonmajors in learning and appreciating science? *CBE-Life Sciences Education, 10*(3), 309–317. https://doi.org/10.1187/cbe.11-03-0040

Hutchinson, K. (1949). An experiment in the use of comics as instructional material. *Journal of Educational Sociology, 23*, 236–245.

Izgi Onbaşılı, Ü. (2020). The effects of science teaching practice supported with Web 2.0 tools on prospective elementary school teachers' self-efficacy beliefs. *International Journal of Progressive Education, 16*(2), 91–110.

Kaya, Z. (2005). *Instructional technologies and material development*. Pegem A Publications.

Krippendorff, K. (2012). *Content analysis: An introduction to its methodology* (3rd ed.). SAGE Publications.

Lazzarich, M. (2013). Comic strip humour and empathy as methodological instruments in teaching. *Croatian Journal of Education, 15*(1), 153–190.

Leylak, D., & Say, S. (2023). Classroom teachers' views on educational comics. *International Journal of Education and New Approaches, 6*(1), 96–127. https://doi.org/10.52974/jena.1268284

Merriam, S. B. (2009). *Qualitative research: A guide to design and implementation: Revised and expanded from qualitative research and case study applications in education*. Jossey-Bass.

Muniran, F., & Yusof, R. (2008). Using comics and graphic novels in schools and libraries to promote literacies. Paper presented at ICOLIS 2008, Kuala Lumpur.

Murphy, J., & Lebans, R. (2008). Unexpected outcomes: Web 2.0 in the secondary school classroom. *International Journal of Technology in Teaching and Learning, 4*(2), 134–147.

Mutlu, Z. (2019). Social studies teacher candidates' views on using educational comics in the social studies teaching process. (Unpublished master's thesis). Muğla Sıtkı Koçman University, Muğla, Turkey.

Olson, J. C. (2008). The comic strip as a medium for promoting science literacy. California State University Press.

Orcan, F. (2013). Use of item parceling in structural equation modeling with missing data. (Unpublished doctoral dissertation). Florida State University.

Özdemir, E. (2010). The effects of educational comics on sixth-grade students' success in the concept of heat transfer. (Unpublished doctoral dissertation). Middle East Technical University, Institute of Science, Ankara.

Palaigeorgiou, G., & Grammatikopoulou, A. (2016). Benefits, barriers, and prerequisites for Web 2.0 learning activities in the classroom: The view of Greek pioneer teachers. *Interactive Technology and Smart Education, 13*(1), 2–18. https://doi.org/10.1108/ITSE-08-2015-0022

Pan, S. C., & Franklin, T. (2011). In-service teachers' self-efficacy, professional development, and Web 2.0 tools for integration. *New Horizons in Education, 59*(3), 28–40.

Pritchett, C. G., Pritchett, C. C., & Wohleb, E. C. (2013). Usage, barriers, and training of Web 2.0 technology applications. *SRATE Journal, 22*(2), 29–38.

Richter, T., Rendigs, A., & Maminirina, C. P. (2015). Conservation messages in speech bubbles—Evaluation of environmental education comic distributed in primary schools in Madagascar. *Sustainability, 7*(7), 8855–8880. https://doi.org/10.3390/su7078855

Rota, G., & Izquierdo, J. (2003). Comics as a tool for teaching biotechnology in primary schools. *Issues in Biotechnology Teaching, 6*(2), 85–89.

Sadaf, A., Newby, T. J., & Ertmer, P. A. (2012b). Exploring pre-service teachers' beliefs about using Web 2.0 technologies in K-12 classrooms. *Computers & Education, 59*(3), 937–945. https://doi.org/10.1016/j.compedu.2012.03.004

Sones, W. (1944). The comics and instructional method. *Journal of Educational Sociology, 18*, 232–240.

Song, Y., Heo, M., Krumenaker, L., & Tippins, D. (2008). Cartoons—An alternative learning assessment. *Science Scope, 32*(1), 16–21.

Tatlı, Z., Akbulut, H. İ., & Altınışık, D. (2016). The impact of Web 2.0 tools on pre-service teachers' technological pedagogical content knowledge self-efficacy. *Turkish Journal of Computer and Mathematics Education, 7*(3), 659–678.

Tokcan, H., & Topkaya, Y. (2015). Concept cartoons as a teaching tool in social studies. *Route Educational and Social Science Journal, 2*(4), 175–185.

Topkaya, Y. (2014). The effect of educational comics on cognitive and affective learning in citizenship and democracy education. (Unpublished doctoral dissertation). Atatürk University, Institute of Educational Sciences, Erzurum.

Topkaya, Y., & Şimşek, U. (2015). The impact of educational comics on attitudes towards citizenship and democracy education. *Journal of Computer and Education Research, 3*(6), 152–167.

Topkaya, Y., & Şimşek, U. (2016). The effect of educational comics on academic achievement and attitude towards earthquakes. *International Online Journal of Educational Sciences, 8*(3), 46–54.

Topkaya, Y., & Yılar, B. (2015). Analysis of student views related to educational comics. *Route Educational and Social Science Journal, 2*(3), 106–117.

Trent, C., & Kinlaw, R. (1979). Comic books: An effective teaching tool. *Journal of Extension, 17*, 18–23.

Tünkler, V. (2021). Experiencing graphic materials with Web 2.0 tools: Social studies teacher candidates' views. *Pamukkale University Journal of Education Faculty, 53*, 234–260. https://doi.org/10.9779/pauefd.795619

Unal, E., & Uzun, A. M. (2019). Using Web 2.0 technologies to support teacher candidates' content development skills. *Cypriot Journal of Educational Science, 14*(4), 694–705.

Upson, M., & Hall, C. M. (2013). Comic book guy in the classroom: The educational power and potential of graphic storytelling in library instruction. *Kansas Library Association College and University Libraries Section Proceedings, 3*(1), 28–38.

Versaci, R. (2007). *This book contains graphic language: Comics as literature*. New York, NY: Continuum.

Ward, S. (2015). The impact of self-efficacy and professional development on implementation of Web 2.0 tools in elementary classrooms. (Unpublished doctoral dissertation). Gardner-Webb University.

Yalın, H. (2003). *Instructional technologies and material development* (8th ed.). Nobel Publications.

Yıldırım, A., & Şimşek, H. (2018). *Qualitative research methods in social sciences*. Seçkin Publications.

Yıldırım, E. (2016). An examination of classroom teacher candidates' views on educational comics. *Kilis 7 Aralık University Journal of Social Sciences, 6*(11), 52–70.

Zimmerman, B. (2008). Creating comics fosters reading, writing, and creativity. *Education Digest, 74*(4), 55–57.

Ethics Statement: This article complies with the journal's writing guidelines, publication principles, research and publication ethics, and journal ethical rules. Responsibility for any violations arising from the article rests with the author. The article received ethics committee approval from the Atatürk University Publication Ethics Committee, dated February 5, 2025, with decision number E-56785782-050.02.04-2500048228.

Declaration of Author(s)' Contribution Rate: The author's contribution rate is 100%.

CONTRIBUTION RATE	CONTRIBUTORS
Idea or Notion	Sinan AKDAĞ
Literature Review	Sinan AKDAĞ
Yöntem	Sinan AKDAĞ
Data Collecting	Sinan AKDAĞ
Data Analysis	Sinan AKDAĞ
Findings	Sinan AKDAĞ
Discussion and Commentary	Sinan AKDAĞ

Funding: No contribution or support was received during the writing process of this study.

Informed Consent Statement: Informed consent forms were obtained from all participants in the study.

Data Availability Statement: All data contained in the article are included within the article.

Conflict of Interest: The author has no conflict of interest with other individuals, institutions or organizations related to the research.