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Research Article

Integration of digital technologies in social studies education in Bulgarian schools–A comparative analysis and evaluation based on the PICRAT model

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ABSTRACT

The present study specifically examines the integration of digital technologies in the domain of social studies education. Its main objective is to examine the current level of digital technology integration in Bulgarian schools, using social studies instruction as a case in point. In this context, the research seeks to address three key research questions (RQs): RQ1. What role does the social studies teacher play in integrating digital technologies into the instructional process? RQ2. What is the role of the student in lessons involving the integration of digital technologies in social studies education? RQ3. For what purposes and in the execution of which didactic and methodological tasks are digital technologies employed during social studies lessons? To achieve these objectives and address the RQs, a comparative analysis and evaluation are conducted based on the PICRAT model. This model is applied to assess the interplay between teachers' use of technology and students' cognitive engagement. The comparative analysis focuses on three target groups: teachers of *geography and economics*, teachers of *history and civilizations*, and teachers of *philosophy and civic education*. The teachers were selected on the basis of a pre-constructed quota framework, according to which a total of 32 teachers were included in the sample. The quota framework was designed to ensure sufficient diversity and scope of the collected qualitative data, necessary for a reliable analysis. Empirical data were collected in two consecutive stages: a preliminary stage (including a semi-structured questionnaire for teachers) and a main stage (including pedagogical classroom observations). The coding and analysis of the collected data were conducted using the software QDA Miner 2025, and the coding procedure comprised 19 codes grouped into five categories. The author-developed coding scheme was designed in accordance with the PICRAT model matrix. The findings of the study reveal a lack of intentionality, coherence, and consistency in the integration of digital technologies in social studies education in Bulgaria. Additionally, the research demonstrates that the PICRAT framework is applicable in the context of Bulgarian schools in two major ways: (1) as a tool for instructional planning, and (2) as a framework for the implementation and evaluation of social studies lessons.

Keywords: digital technologies, social studies education, PICRAT model, teaching, learning, functions of digital technologies

Author Note: This study is part of a comprehensive research initiative designed to evaluate the current state of digitalization in Bulgarian education. This initiative is conducted under the auspices of the SUMMIT project (BG-RRP-2.004-0008), which is financed by the European Union through NextGenerationEU and the National Recovery and Resilience Plan. The project is spearheaded by Prof. Roumiana Peycheva-Forsyth, PhD.

INTRODUCTION

The integration of technology into social studies education[1] presents a multifaceted challenge for educators within three primary contexts: first, the state's continuously evolving regulatory requirements for education; second, the rapidly developing digital educational resources; and third, the diverse learning needs associated with various curricular contents. It is improbable that any social studies educator can accurately predict which specific technologies their students will utilize in the future or how digital technologies will evolve throughout their teaching career. In this regard, an educator seeking to implement technology integration in a meaningful, effective, and sustainable manner faces a substantial challenge. Such an educator requires an appropriate model, theory, paradigm, conceptual framework, or practical guide to navigate this process–something that, according to the authors, the PICRAT model effectively provides. But why this particular model? PICRAT has two parts representing two guiding questions: PIC and RAT. The PIC part responds to the question "What is the student's relationship to the technology?" with one of three responses: Passive, Interactive, or Creative. The RAT part responds to the question "How is the use of technology influencing the teacher's existing practice" with one of three responses: Replacement, Amplification, or Transformation. What are the justifications for its selection? First, the model's emphasis on the key actors and their roles within the teaching and learning process is of central importance, and second, its adaptability to the needs and demands of educational practice. Justification of the study at present, various theoretical models are employed to conceptualize effective technology integration in teaching practice. Among the most commonly referenced are Technological Pedagogical Content Knowledge (TPACK) (Koehler & Mishra, 2009), Substitution, Augmentation, Modification, Redefinition (SAMR) (Puentedura, 2003), Technology Integration Planning Model (TIP) (Roblyer & Doering, 2013), Technology-integrated matrix (TIM) (Harmes et al., 2016), Technology Acceptance Model (TAM) (Venkatesh et al., 2003), Levels of Technology Implementation (LoTi) (Moersch, 1995), and Replacement, Amplification, Transformation (RAT) (Hughes et al., 2006). Each of these widely recognized models of technological integration possesses its own strengths and weaknesses. The search for the most adaptive model necessarily involves identifying the key limitations or shortcomings inherent in these frameworks, particularly in the context of integrating technology into social studies education. Our aim is not to dismiss the advantages offered by these models, but rather to justify the selection of the most contextually appropriate and pedagogically adaptive one. As Kimmons and Hall (2016a, p. 54) note, "*different models are useful and valuable in different contexts*." In this sense, it is hardly feasible to "*establish a single theoretical perspective or methodology as superior*" (Burkhardt & Schoenfeld, 2003, p. 9). It is also unjustified to adopt theoretical models without prior discussion of their potential, limitations, internal contradictions, and practical implications (Kimmons et al., 2020, p. 3), since "no one [model] ever solves all the problems it defines," and "no two [models] leave all the same problems unsolved" (Kuhn, 1996, p. 110). For the present study, the selection of the most adaptive model is grounded in the six quality criteria proposed by Kimmons & Hall (2016a) (see **Table 1**).

As noted above, each technology integration model has its strengths and weaknesses. Within the context of the present study, our aim is neither to present futile arguments against these models nor to ignore their potential, but rather to justify the selection of the most adaptive model for the practice of social studies education.

According to the criteria outlined in **Table 1**, the following key observations emerge:

1. Many models are unclear to teachers. For example, SAMR, TIM, and TPACK offer different levels of integration but likely do not sufficiently distinguish or clearly define them. In this respect, these models remain ambiguous and, to some extent, unhelpful for educators.
2. Many models are based on constructs that are impractical for teachers' everyday needs. For instance, TAM has no application in lesson planning, guiding student learning, or classroom behavior management. Even models specifically developed for teachers tend to focus on activities incompatible

[1] For the purposes of the present study, social sciences education is examined in a narrow sense and encompasses the processes of teaching and learning in the classroom within the subjects "geography and economics," "history and civilizations," and "philosophy and civic education."

Table 1. Criteria and guiding questions for evaluating technology integration models in social studies education (adapted from Kimmons & Hall, 2016a, 2016b; Kimmons et al., 2020)

Criterion	Guiding Question & Justification
Clarity	*Is the model sufficiently simple, clear, and easy to understand?* The model should be concise enough to be easily explained to teachers and readily applicable in their practice–that is, it should be intuitive, practical, and easy to use for instructional planning and evaluation.
Compatibility	*Does the model complement and support existing practices in social studies education?* The model needs to be adaptable to current teaching practices in social studies, ensuring it can have a noticeable impact and realistic access to technology within the classroom environment.
Productivity	*Does the model stimulate productive thinking among teachers regarding the challenges of technology integration in the classroom?* Does its application contribute to diverse goals, support interdisciplinary connections, highlight key ideas, and enrich teaching practice?
Role of technology	*Does the model view technology integration to achieve specific educational goals, or is technology used merely for its own sake in teaching?* It is essential that technology not only diversifies teaching practice but also actively contributes to achieving concrete learning objectives in social studies education.
Scope	*Is the model balanced? Does it overlook aspects of technology integration that are not useful to teachers? Does it provide sufficiently comprehensive guidance for teachers in their practice?* The model should be specifically focused on social studies teachers, with practical applicability in their real classroom environments.
Focus on students	*Does the model clearly emphasize students and their learning outcomes?* A student-centered focus is essential for any technology integration model, as “any change in the educational system must ultimately lead to a change in students’ thinking” (Willingham, 2012, p. 155).

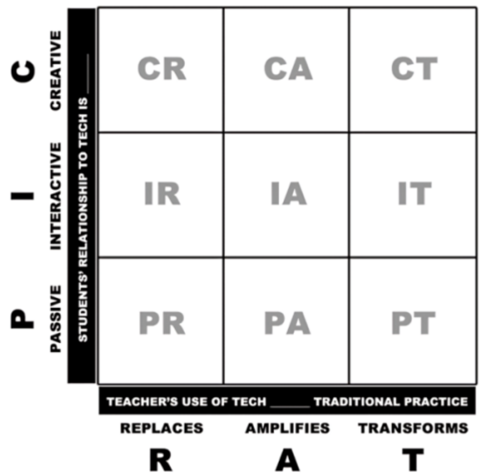

Figure 1. The PICRAT matrix (Kimmons et al., 2020, p. 189)

with teacher needs (e.g., student activity in LoTi) or are too theoretical to be directly applied in practice (e.g., technological content knowledge in TPACK).

3. Many models do not lead teachers to generate productive ideas but rather provide meaningless assessments of their practice. For example, the TIM model has too many integration levels–25 across two dimensions (5 × 5)–making it confusing and cumbersome.
4. Many models are techno-centric, focusing on the use of technology as an end rather than as a means to achieve specific educational outcomes. TAM, for example, focuses on technology acceptance rather than improving the effectiveness of teaching and learning.
5. The models are not effectively balanced for practice, being either too prescriptive (e.g., TIP) or covering too broad a scope (e.g., TPACK provides teachers with a conceptual framework to synchronize components but lacks concrete guidance for practical application).
6. Most models are not student-centered, as they focus on technology adoption or teacher goals rather than on students.

Against this backdrop of limitations, the authors direct attention to the PICRAT model, as it is genuinely practice-oriented, assessing both teacher and student work. The evaluation is conducted by answering two key questions: *What is the student doing with technology?* And *what is the teacher doing with technology?* (**Figure 1**).

As illustrated in **Figure 1**, the model delineates three principal roles of students in their engagement with technology for learning: passive learning, where students receive content without active engagement; interactive learning, where students engage with content and/or peers; and creative learning, where students construct knowledge through the creation of artifacts (Papert & Harel, 1991). Traditionally, social science educators have integrated technologies into the learning process in a manner that positions students as passive recipients of knowledge. For instance, converting core lesson content into PowerPoint presentations or displaying YouTube videos in social science classes often results in students becoming passive listeners or observers rather than active participants in the learning process. While listening, observing, and reading are essential skills, they are insufficient for effective learning in contemporary social science education. Paradoxically, many educators who begin integrating technology into their teaching practices start at this passive level and require guidance to advance beyond it. Effective learning is achieved when students are actively engaged through inquiry, experimentation, collaboration, and active classroom participation (Kestler, 2020; Rinschede & Siegmund, 2022). Technologies in social science lessons can facilitate interactive activities such as games, computerized adaptive tests, simulations, or digital flashcards for reviewing material from previous lessons. This interactive level of technology use fundamentally differs from the passive level, as students directly engage with the technology, and their learning is mediated through this interaction. However, the interactive use of technology is somewhat constrained because instruction is largely structured by the technology rather than the student, limiting opportunities to establish important causal connections with previously learned material. The creative level of technology integration in social science education addresses this limitation by encouraging students to use technology to create educational artifacts, thereby mastering their learning (Kimmons et al., 2020). The most effective learning occurs when students apply their skills and abilities to construct real or digital artifacts for problem-solving (Papert & Harel, 1991), aligning with the highest levels of the well-established Bloom's taxonomy (Anderson et al., 2001). These three levels of technology application in social science lessons can correspond to different instructional goals. For example, the same technology might be used to teach the same content, but student activities with that technology differ, reflecting distinct student roles in the learning process. This focus on student behavior overcomes the techno-centric approach to education, which attributes educational value solely to the technology itself. This rationale underpins the authors' choice to apply the PICRAT matrix in the present study, particularly as the three PIC levels suit various instructional aims and contexts. Similarly, the RAT acronym identifies three potential teacher roles in social science teaching practice: Replacement, Amplification, and Transformation. Experience indicates that teachers often use technology to replace traditional didactic resources with digital ones without functionally altering their practice. While this replacement level of technology use is not necessarily poor practice, it does not fully realize the benefits of technology in social science education. At the amplification level, teachers use technology to enhance the effectiveness of their practice; however, no fundamental transformation occurs.

Within the study's context, the PICRAT matrix enables evaluation of the teacher's role in social science education as well. In summary, the selection of the PICRAT matrix for assessing digital technology integration in social science education for this study is justified by the following:

1. It is simple, clear, and easy to understand.
2. It is adaptive to contemporary goals and instructional practices in social science education, emphasizing the student rather than the technology itself.
3. It integrates technology as a means to achieve specific educational objectives rather than as an end in itself.

Based on this rationale, the authors formulate the guiding idea and aim of the study, define key research questions (RQs), and establish the methodological framework. As part of a broader, large-scale investigation and analysis of the current state of digitalization in Bulgarian education, presently conducted under the SUMMIT BG-RRP-2.004-0008 project funded by the EU through NextGenerationEU and the National Recovery Plan, led by Prof. Roumiana Peycheva-Forsyth, PhD, this study follows the already developed methodological framework within the project (Mizova et al., 2025; Peycheva-Forsyght & Mizova, 2025).

Table 2. Distribution of schools in the sample by main characteristics

Characteristic		Distribution (%)
Location	Village	43
	Town	23
	Regional center	34
Type of school	Primary	63
	Secondary	31
	High school	6
School size*	Small	35
	Medium	30
	Large	35

Note. *Small (up to 100 students); Medium (101-300 students); & Large (over 300 students)

MATERIALS AND METHODS

Description of the Sample

The research methodology employed in this study is pragmatically oriented, facilitating a concentrated investigation of specific RQs and the identification of their solutions. The study particularly emphasizes the current state of digital technology integration in social sciences education within Bulgarian schools. A mixed-methods research design was utilized, incorporating both quantitative and qualitative approaches.

Initially, a nationally representative quantitative study was conducted, utilizing a probability-based stratified cluster sample of 359 schools. This sample was designed to mirror the structural characteristics of all general education schools in Bulgaria, based on data pertaining to the target population for the 2023/2024 academic year. The sampling frame encompassed all schools offering full-time education for students from grade I to grade XII, excluding vocational secondary schools and centers for special educational support. The total number of units in the target population is 1,967 schools. The sample size was determined using a standard formula for proportions and a finite population, with a 95% confidence interval, a maximum permissible sampling error of 4.6%, and $p = 0.5$ (assuming maximum variability). This calculation resulted in a required minimum sample of 359 schools, ensuring statistical representativeness. A two-stage stratified cluster sampling design was implemented, with each school constituting a separate cluster. The first stage involved stratification according to four criteria: administrative region (NUTS 3, comprising the 28 regions of the country); type of settlement (village, town, regional center); type of school (primary, secondary, upper secondary/gymnasium); and school size (small–up to 100 students; medium–101-300 students; large–over 300 students). The second stage involved the random selection of schools within each stratum, with the number of selected schools proportional to the relative share of the respective stratum in the target population. Additionally, selection was conducted using probability proportional to size, whereby schools with a larger number of students had a higher probability of inclusion. The distribution of schools in the sample according to the main characteristics is presented in **Table 2**.

The sample constructed at the preliminary stage ensures high external validity and allows for subsample comparisons and analyses aimed at examining various aspects of digitalization in Bulgarian school education. This provides a foundation for the authors to conduct the present mixed-methods study involving three focus groups of teachers–teachers of "geography and economics," teachers of "history and civilizations," and teachers of "philosophy and civic education"–with the following characteristics (**Table 3**).

The participants in the study were selected from a constructed micro-sample of 30 schools, which constitutes a purposive subset of the previously established nationally representative sample of 359 schools. The purpose of this micro-sample is to ensure greater analytical depth within the context of the present study. The selection of schools was based on predefined stratifying criteria that reflect key characteristics of the Bulgarian school system. Within each of the 30 selected schools, a structured selection of teachers was conducted following a proportional model based on school size and subject area. This approach ensured representation across all educational stages and subject areas within the microsample. Stratification by subject area was implemented to guarantee balanced representation of teachers across all major disciplinary domains. A targeted quota framework was developed to define the planned number of teachers (participants) within the subject category of social sciences (a total of 32). The chosen sampling design for participant

Table 3. Main characteristics of the sample in the study

Characteristic		Subject		
		Geography and economics	History and civilizations	Philosophy and civic education
Gender	Male	3	2	1
	Female	5	10	6
Education	Bachelor	2	3	5
	Master	5	8	1
	PhD	1	1	1
Work experience	< 5	3	3	-
	5-9	-	1	-
	10-19	2	6	3
	> 19	3	2	1
Location	Village	2	4	1
	Town	1	-	-
	Regional center	5	8	6
Type of school	Primary	5	5	2
	Secondary	2	5	3
	High school	1	2	2
School size*	Small	2	5	-
	Medium	3	5	5
	Large	3	2	2
Educational stage	Lower secondary	5	7	-
	1st high	3	5	5
	2nd high	-	-	2

Note. *Small (up to 100 students); Medium (101-300 students); & Large (over 300 students)

selection allows for both in-depth understanding and comparative interpretation across the various subject areas within the field of social sciences. Five of the 32 initially planned participants declined participation in the study, resulting in a final sample of 27 teachers.

Procedures

The study is based on two groups of collected and processed empirical data. The first group comprises previously gathered information on social science lessons (a total of 27 lessons, including 8 in “geography and economics,” 12 in “history and civilizations,” and 7 in “philosophy and civic education”). The data collection instrument used was a semi-structured survey containing information regarding the planned objectives, tasks, and lesson flow in the context of their digital transformation. The instrument generates specific information on the planned lesson scenarios, including which objectives and tasks are intended by teachers to be implemented through particular digital technologies and resources, at which stages of the lesson, as well as which student activities involving digital technologies and resources are planned at each stage of the lesson. The second group includes data collected from 27 pedagogical observations of the aforementioned lessons, documented in specially developed protocols created for the purposes of this study. This data collection tool provides information on each stage of the lesson’s progression within the context of its digital transformation. Each pedagogical observation was recorded in four types of protocols:

1. Protocol 1–Introduction and motivation of the topic
2. Protocol 2–Development of new educational content
3. Protocol 3–Reinforcement and assignment of homework
4. Protocol 4–Assessment

A total of 108 protocols were collected and processed (32 for “geography and economics” lessons; 48 for “history and civilizations” lessons; and 28 for “philosophy and civic education” lessons). The instrument generates information on the implementation of digital technologies and resources at specific stages of the observed lessons, including which lesson objectives are achieved in which situations; what roles teachers and students assume in different situations; and which digital technologies and resources are used in each situation.

The data generated by the two groups of instruments enable a comparative analysis and evaluation of the planned lesson scenarios and their practical implementation in actual classroom teaching.

Table 4. Coding procedure and collected data*

Category	Code	Count	PC-1 (%)	Cases	PC-2 (%)
C1. Teacher's role	Replaces	34	8.20	17	19.10
	Amplifies	37	8.90	21	23.60
	Transforms	9	2.20	7	7.90
C2. Student's role	Passive	32	7.70	17	19.10
	Interactive	38	9.10	21	23.60
	Creative	10	2.40	8	9.00
C3. Role in the lesson	Motivation	14	3.40	13	14.60
	Development of new content	31	7.50	25	28.10
	Consolidation	21	5.00	18	20.20
	Assessment and control	17	4.10	13	14.60
C4. Tools for implementation	Presentation	32	7.70	21	23.60
	Digital textbook	11	2.60	9	10.10
	Digital platforms and websites	31	7.50	20	22.50
	Online games and simulations	14	3.40	11	12.40
	Software	2	0.50	1	1.10
	Other	1	0.20	1	1.10
C5. Activity with the tool	Listening, observation, reading	34	8.20	17	19.10
	Document review, data collection and analysis	38	9.10	21	23.60
	Creation of artifacts	10	2.40	8	9.00

Note. *Each teacher (case) produced a varying number of lesson registrations (count); PC-1: Percentage of codes; & PC-2: percentage of cases

Table 5. Role of the teacher in the context of digital transformation of social sciences education (number of occurrences/percentage)*

Teacher's role	Subject		
	Geography and economics	History and civilizations	Philosophy and civic education
Replaces	6/60.00%	8/61.50%	3/75.00%
Amplifies	6/60.00%	12/92.30%	3/75.00%
Transforms	2/20.00%	4/30.80%	1/25.00%

Note. *The calculations were conducted based on the observed and documented situations within the lessons

Data Analysis

The coding of the analysis of the collected data was performed using the software QDA Miner 2025. The coding procedure involved 19 codes, grouped into five categories:

1. Category 1–Teacher's role (C1)
2. Category 2–Student's role (C2)
3. Category 3–Role in the lesson (C3)
4. Category 4–Implementation tools (C4)
5. Category 5–Activity with the tool (C5) (see **Table 4**).

Categories 1 and 2 were coded in full accordance with the evaluation matrix of the PICRAT model and were used to address RQ1 and RQ2. Coding within categories 3, 4, and 5 was aimed at answering RQ3.

RESULTS

The results of the data analysis are presented sequentially according to the five categories outlined above. A comparative approach is used to identify correlations across the teaching of "geography and economics," "history and civilizations," and "philosophy and civic education."

Category 1. Role of the Teacher

The data generated from the two data sets under category 1, role of the teacher, reveal the following key findings: The most frequently observed functions of digital technologies demonstrated by social sciences teachers are the substitutive and augmentative roles. A slight predominance of the augmentative function is

Table 6. Student role in the context of digital transformation in social sciences education (number of registrations/percentage)*

Student's role	Subject		
	Geography and economics	History and civilizations	Philosophy and civic education
Passive	6/60.00%	8/61.50%	3/75.00%
Interactive	6/60.00%	12/92.30%	3/75.00%
Creative	3/30.00%	4/30.80%	1/25.00%

Note. *The calculations were conducted based on the observed and documented situations within the lessons

Table 7. Role in the lesson in the context of the digital transformation of social sciences education (number of registrations/percentage)*

Role in the lesson	Subject		
	Geography and economics	History and civilizations	Philosophy and civic education
Motivation	6/60.00%	5/38.50%	2/50.00%
Development of new content	8/80.00%	13/100%	4/100%
Consolidation	4/40.00%	11/84.60%	3/75.00%
Assessment and control	5/50.00%	7/53.80%	1/25.00%

Note. *The calculations were conducted based on the observed and documented situations within the lessons

noted in the teaching of "history and civilizations." The transformative function accounts for the smallest proportion across all three subjects (**Table 5**).

An interesting correlation regarding the two data groups in category 1 is the discrepancy between the predominance of the "augmenting" function registered across all subjects during lesson planning and its reporting as a "substituting" function in the observation protocols. This discrepancy is most pronounced in the teaching of "history and civilizations." In this regard, the reported predominance of the augmenting function in this subject area can be considered disputable.

Category 2. Role of the Student

The data generated from the two groups in category 2 reveal the following notable findings: the most frequently registered student roles are the passive and interactive roles, which are equally represented in the teaching of "geography and economics" and "philosophy and civic education." An emphasis on the interactive role is observed in the teaching of "history and civilizations." The creative role of the student receives the fewest registrations across all social science subjects (see **Table 6**). An interesting correlation is observed in "philosophy and civic education," where the creative role of the student is not reported in the lesson planning phase, rendering its occurrence in the observation protocols incidental and random.

Another interesting correlation regarding the two data sets in category 2 (student role), similar to that observed in category 1 (teacher role), is the discrepancy between the role registered during lesson planning as interactive for all subjects and the role actually observed and recorded as passive in the observation protocols. This discrepancy is most pronounced in the teaching of "history and civilizations." Consequently, the predominance of the interactive student role in this subject area is considered debatable.

Category 3. Role in the Lesson

The data generated from both sets in category 3 (role in the lesson), in the context of the digital transformation of social sciences education, reveal certain notable patterns. The most significant role of digital technologies within the lesson as a whole is observed during the development of new educational content (**Table 7**). Comparatively across subjects, some differences emerge. In "geography and economics" education, a more balanced application of digital technologies is recorded across various didactic and methodological tasks within the lesson, including the motivation of the topic and the development of new content. In contrast, in "history and civilizations," a considerable application of digital technologies is noted in the consolidation of newly learned content and in assessment activities. Another interesting correlation related to the applicability of digital technologies in "philosophy and civic education" concerns the discrepancy between the planned roles in the lesson and the roles actually registered in the observation protocols.

Table 8. Tools for implementation in the lesson in the context of the digital transformation of social sciences education (number of registrations/percentage)*

Tools for implementation	Subject		
	Geography and economics	History and civilizations	Philosophy and civic education
Presentation	6/60.00%	11/84.60%	4/100%
Digital textbook	3/30.00%	4/30.80%	2/50.00%
Digital platforms & websites	4/40.00%	6/46.20%	1/25.00%
Online games & simulations	6/60.00%	11/84.60%	3/75.00%
Software	1/10.00%	0/0.00%	0/0.00%
Other	1/10.00%	0/0.00%	0/0.00%

Note. *The calculations were conducted based on the observed and documented situations within the lessons

Table 9. Activity with the tool in the context of the digital transformation of social sciences education (number of registrations/percentage)*

Role in the lesson	Subject		
	Geography and economics	History and civilizations	Philosophy and civic education
Listening, observation, reading	6 / 60.00%	8 / 61.50%	3 / 75.00%
Document review, data collection and analysis	6 / 60.00%	12 / 92.30%	3 / 75.00%
Creation of artifacts	3 / 30.00%	4 / 30.80%	1 / 25.00%

Note. *The calculations were conducted based on the observed and documented situations within the lessons

Category 4. Tools for Implementation

The data generated from both groups in category 4 (tools for implementation) within the lesson, in the context of the digital transformation of social sciences education, reveal significant diversity when compared across subjects. The most commonly applied tools overall are presentations, electronic platforms, and websites, as well as digital textbooks (**Table 8**). A notable feature in the teaching of “geography and economics” is the presence of specific software and specialized digital geographic tools registered in the observation protocols. Another distinct characteristic regarding “philosophy and civic education,” in comparison to “history and civilizations” and “geography and economics,” is the low frequency of use of the recorded tools.

Category 5. Activity With the Tool

The data generated from both groups in category 5 (activity with the tool), within the context of the digital transformation of social sciences education, reveal certain differences when compared across subjects. The two groups of activities with the highest number of registrations are: listening, observing, reading and reviewing documents, and collecting and analyzing data (**Table 9**). Activities related to reviewing documents, collecting, and analyzing data are recorded with the greatest frequency in the teaching of “history and civilizations.” The lowest number of registrations concerns the creation of artifacts, particularly in the context of “philosophy and civic education.”

DISCUSSION

How are the Above-Mentioned Results Evaluated according to the PICRAT Model Matrix?

The evaluation of the results from social sciences education by subject area is presented in **Figures 2**, **3**, and **4**. In a comparative perspective, some common characteristic features can be identified across the three social science subjects.

1. Overall, there is a noticeable discrepancy between the planned and the actual roles of digital technologies in the lessons. This clearly demonstrates the need for a simple, clear, and easily understandable model that is adaptable to contemporary goals and teaching practices in social science education, emphasizing the learner rather than the technology itself.
2. The evaluation of the learning outcomes across the three subjects, based on the PICRAT matrix, reveals a predominant substitutive role of technologies and passive learning by students. There is a high applicability of presentations, electronic websites, and digital textbooks primarily for visualization

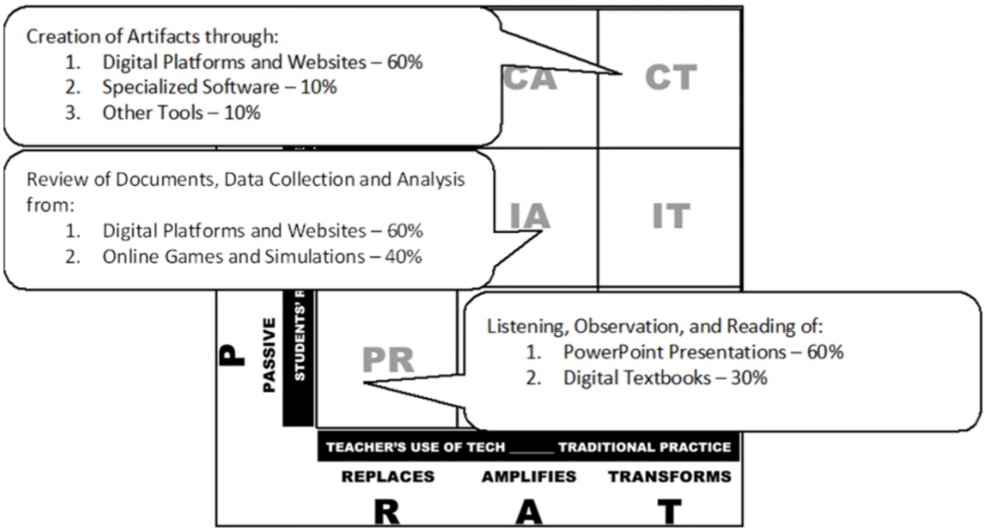

Figure 2. Integration of digital technologies in "geography and economics" according to the PICRAT matrix (Source: Generated by authors from the collected data)

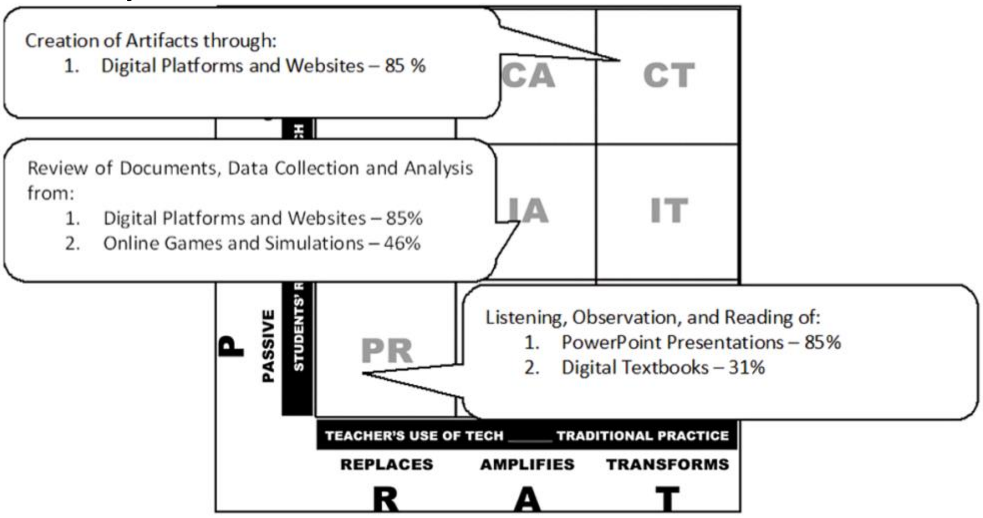

Figure 3. Integration of digital technologies in "history and civilizations" according to the PICRAT matrix (Source: Generated by authors from the collected data)

purposes in social science lessons. This results in students taking on passive roles as listeners and observers rather than active participants in the learning process.

3. A gradual shift towards effective learning in social science education is observed through the interactive engagement of students in inquiry, experimentation, collaboration, and active behavior in the classroom and lesson. Digital technologies are employed to play games, solve digital quizzes, and use simulations to recall previous lesson content, reinforce knowledge, and conduct assessments. This demonstrates an interactive level of digital technology application in social science education.
4. Creative use of technologies in the learning process, which encourages students to employ them for the creation of educational artifacts, is observed infrequently. However, when considering the creative level, there is no clear evidence of a purposeful effort to seek the creative function of technologies during lessons.
5. Regarding the application of digital technologies in social science lessons, two general observations emerge. First, there is a lack of intentionality, synchronization, and consistency in lesson planning. Second, the potential of digital technologies is only partially harnessed during lesson implementation. A comprehensive and fundamental digital transformation of social science education has not yet been realized.

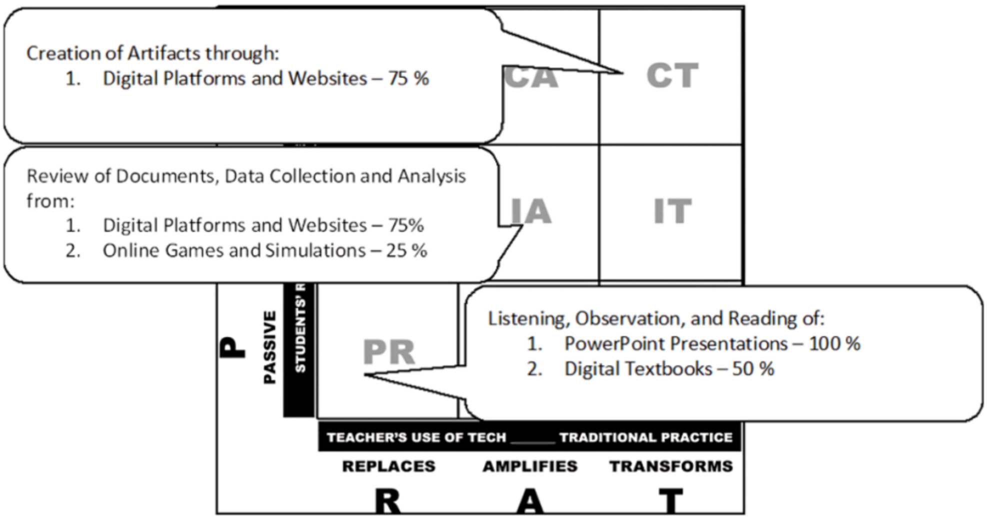

Figure 4. Integration of digital technologies in "philosophy and civic education" according to the PICRAT matrix (Source: Generated by authors from the collected data)

CONCLUSION

In conclusion, a comprehensive response is provided to the three RQs formulated at the outset.

RQ1. What role does the social science teacher play regarding the integration of digital technologies in the teaching process?

The response to this RQ confirms the common practice of social science teachers incorporating digital technologies in the learning process that primarily offer knowledge to students as passive recipients. It was established that most teachers transform the main lesson points into presentations and utilize electronic websites and digital textbooks primarily for visualization purposes during lessons. The observed augmentative function of technologies did not demonstrate purposeful planning or implementation; a fundamental transformation of teaching practices by social science teachers cannot yet be claimed.

RQ2. What is the role of the student in the lesson regarding the integration of digital technologies in social science education?

The answer to this question also confirms the predominance of the traditional student role in social science education as passive observers, listeners, and knowledge recipients. A gradual shift towards interactivity is noted through inquiry, experimentation, collaboration, and active behavior in the classroom and lesson. However, there is an absence of deliberate effort in the reported creative production of artifacts during the learning process. Systematic and effective student learning through the application of skills and competencies in constructing digital artifacts and problem-solving aligned with Bloom's taxonomy (Anderson et al., 2001) has yet to be realized.

RQ3. For what purposes and in the execution of which didactic and methodological tasks are digital technologies used in social science lessons?

The response to this final RQ reveals the lack of a unified methodology for integrating digital technologies in social science education with respect to goal-setting, planning, and execution of the didactic and methodological tasks of lessons. Overall, digital technologies play the most significant role in the development of new learning content; however, notable differences were observed across the different subjects.

The answers to the three RQs support the conclusion that a fundamental digital transformation in social science education in Bulgarian schools is not yet realized. The identified lack of intentionality, synchronization, and consistency regarding the integration of digital technologies clearly confirms the need for a unified methodology. Additionally, the PICRAT model matrix proves applicable in Bulgarian school practice in two ways: first, regarding the planning of instruction, and second, regarding the implementation and evaluation of social science lessons.

Limitations of the Analysis and Directions for Future Research

For several reasons, the present study cannot claim to be exhaustive. The sample size is relatively small, and the analyzed lessons are limited to lessons introducing new knowledge. In addition, the analysis relies on a single analytical framework–PICRAT–and is focused on a national context. In this respect, the authors identify clear perspectives for future research.

Within the national context, the sample could be expanded, allowing for a more in-depth comparative analysis at both intra-disciplinary and interdisciplinary levels. It would also be methodologically justified to extend the scope of analysis to include all types of lessons, such as activity-based lessons, consolidation lessons, and assessment lessons. Furthermore, it would be relevant to examine longitudinal changes in the teaching practices of educators working within the PICRAT framework. In our view, the results of such studies would make a substantive contribution to the practice of social sciences education in Bulgarian schools.

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