Historical thinking in a digital environment: Swedish history teaching analysed through a TPACK lens

Pensamiento histórico en un entorno digital: La enseñanza de la historia en Suecia analizada desde la perspectiva TPACK

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Abstract

This paper presents results from a large-scale study of history teachers in Swedish secondary schools. The study examines perceptions of history, content being taught, teaching methods and use of digital technology. The study uses the Technological Pedagogical and Content Knowledge (TPACK) framework to analyse the results together with narrative theory.

The main results indicate that knowledge of the past and contemporary perspectives from a canonical tradition are prioritised, together with a content-based lecture-style pedagogy. The use of digital technology does not seem to challenge methods or bring new perspectives to history teaching. However, to fully understand history teaching with technology, a framework that emphasises all parts of history education is needed. This calls for further development of the TPACK model, which is further discussed in this article.

Keywords: TPACK, Digitalisation, History Teaching, History education.

Resumen

Este artículo presenta los resultados de un estudio a gran escala de profesores de historia en centros de secundaria suecos. El estudio examina las percepciones de la historia, el contenido que se enseña, los métodos de enseñanza y el uso de la tecnología digital. El estudio utiliza el marco de Conocimientos Pedagógicos y de Contenido Tecnológicos (TPACK) para analizar los resultados junto con la teoría narrativa.

Los principales resultados indican que se da prioridad al conocimiento del pasado y a las perspectivas contemporáneas desde una tradición canónica, junto con una pedagogía basada en el contenido y de tipo lectivo. El uso de la tecnología digital no parece cuestionar los métodos ni aportar nuevas perspectivas a la enseñanza de la historia. Sin embargo, para comprender plenamente la enseñanza de la historia con tecnología, se necesita un marco que haga hincapié en todas las partes de la enseñanza de la historia. Esto exige un mayor desarrollo del modelo TPACK, que se analiza con más detalle en este artículo.

Palabras Clave: TPACK, Digitalización, Enseñanza de la historia, Educación en historia.

1. Introduction

The digitalisation of Swedish schools is part of a global process that affects all aspects of society. Digitalisation is assumed to create new educational opportunities. In Swedish policy documents, hopes predominate about technology as an enabler, possibly

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Bruér, M. (2023). Historical thinking in a digital environment: Swedish history teaching analysed through a TPACK lens. *Clio. History and History Teaching, 49.* DOI: https://doi.org/10.26754/ojs_clio/clio.2023499536 - / Recibido 13-07-2023 / Aceptado 16-11-2023

changing and improving education and gaining better results in Swedish schools (Government Offices, 2017; Swedish Association of Local Authorities and Regions, 2019). This paper examines history teachers' perceptions of teaching and digitalisation and, places them in a broader societal context, where their teaching is a piece of a larger educational puzzle.

Research questions

This paper builds on a large-scale survey conducted during the fall of 2022. The survey examined history teachers in Swedish secondary schools (with students ages 13–16), what content was taught, their teaching methods and how digital tools were used. The central hypothesis is that external factors, such as technology, affect teachers' everyday professional setting. This paper aims to understand whether digitalisation has changed history teaching in Sweden and how the content and practices in history teaching can be understood in relation to technology.

The current state of research

The digitalisation of teaching has been built around the ideas of increased possibilities and hopes that applying digital tools would lead to greater engagement, a better understanding of history and access to materials that have not been available before – hence, the better teaching of history (Walsh, 2017). This relates to the notion that technology cannot be perceived as merely an *add-on component* but must lead to a fundamental change of content and pedagogy to evolve towards active learning and *making history* rather than transmitting and receiving (Lévesque, 2009).

Researchers have argued that technology in education today is inevitable; the question is how technology affects history education. Hopes have been raised that digitalisation can increase the quality of history education, making it more engaging and expressive. This is often connected to the hope of moving away from content-based teaching to more student-centred teaching (Corrigan, Ng-A-Fook, Lévesque, & Smith, 2013; Lévesque, 2009, 2014).

The integration of new technologies depends on general knowledge and beliefs about technology. The integration of technology can be complicated and can often lead to supporting existing practices rather than developing new ones (Pettersson, 2021). There is a need to examine how this impact works, and it is vital to understand why and how teachers use technology to provide meaningful and challenging teaching (Wilson & Wright, 2010).

The impact on history teaching is observable due to the focus on the use of digital sources, which are believed to significantly influence history teaching due to their vast availability (Gomez, 2016), and the expectation that digital education can develop new ways of affecting students' historical thinking (Goulding, 2021). This aligns with Swedish research that has mainly explored the potential of digital sources and digital media to

develop students' historical thinking (Johansson, 2014; Nygren, 2009, 2014; Nygren, Sandberg, & Vikström, 2014; Sandberg, 2014). The use of computers in teaching challenges the role of the teacher, teaching traditions and choices of content and practices in relation to the limitations and possibilities of using digital tools (Kjellsdotter, 2020; Tallvid, 2015)

According to Eliasson and Nordgren (2016), Swedish history teaching rests upon rigid traditions of content. They suggest that digitalisation could challenge these traditions and provide new historical perspectives. However, if history is viewed as a collection of facts and stories, teaching will focus on transmitting these (Lévesque, 2014). The digitalisation of history teaching has the potential to break down gatekeeping functions and facilitate new perspectives. The key lies in understanding how and why teachers use technology to provide meaningful and challenging teaching (Corrigan et al., 2013).

2. Theoretical approaches

Teaching can be divided into three main areas: planning, execution and evaluation. This study focuses on how teachers describe classroom practice and the execution of teaching.

Technology in history teaching

Focusing on the executive dimension of teaching highlights the necessity of a framework to comprehend the role of technology in teaching history. Consequently, this study used the Technological Pedagogical and Content Knowledge (TPACK) framework (Mishra & Koehler, 2006). TPACK is a development of Lee Shulman's Pedagogical Content Knowledge (PCK), described as a combination of included constructs and a unique form of teacher knowledge (Shulman, 1986, 1987). Technology is added to the TPACK model. The three constructs combined are supposed to create a form of knowledge that goes beyond the three included. These concurrent constructs emerge into a specialised form of knowledge, called TPACK (Koehler & Mishra, 2009; Mishra & Koehler, 2006).

TPACK has been criticised for its lack of precision and problems establishing boundaries between the constructs included (Archambault & Barnett, 2010; Graham, 2011). Because the model focuses on knowledge rather than how teaching transpires, it has been difficult to use for studying actual teaching practices (Gómez, 2015).

Nonetheless, TPACK offers a constructive way to examine how subject teaching with technology can be understood. Using the model on history in practice brings specific perspectives to the foreground: *what* history is being taught and *how* it is taught are two, focusing on the model's content dimension. Since technology has often been detached from subject knowledge, it is essential to connect these to understand how technology affects teaching (Gómez, 2015; Lévesque, 2009). Technology is an add-on component

that cannot be viewed as a natural part of teaching. Hence, it changes and can mean different things at different times.

Narrative Competence in the Swedish history syllabus

The Swedish history syllabus is based on the narrative notion of a chronological perspective and includes second-order concepts and factual knowledge. It is not regarded as canonical but as a minimum cohesive framework.

The theoretical grounds for the history syllabus are based on German historian Jörn Rüsen's claim that historical consciousness rests on a narrative competence connected to three dimensions of history. The experience dimension is connected to teaching *historical content*. The interpretation dimension is connected to analysing historical sources, and the orientation dimension is connected to using *history* (Eliasson, Alvén, Yngvéus, & Rosenlund, 2015). Students require more than factual knowledge to develop historical consciousness and make connections between the past, present and future (Rüsen, 1988, 2005). This perspective of history makes it possible to evolve how students think about, of and from history. In contrast, a lack of these perspectives could cause problems with students' understanding of history and their identity in the '*warp and woof of historical knowledge*' and constructing meaning and identity (Rüsen, 2005, p. 27).

Since the three narrative dimensions are rooted in and depend on a surrounding historical culture (Eliasson, 2014), it is essential to consider which historical culture is mediated to students. For example, students from minority groups tend to experience difficulty embracing historical narratives that differ from their identities, creating varying prerequisites for learning and engaging in history (Alvén, 2021).

A narrative approach to history teaching, in which the three perspectives are included within the teaching framework, can make history meaningful by focusing on an individual and collective understanding of our place in the tapestry of time. The influx of digital technology can potentially change the prerequisites of history teaching. This calls for a theoretical discussion of what happens with historical narration when these outer limits of education change.

3. Method

The survey used TPACK and teaching history in a digital context as a theoretical starting point. All items were measured on a 1–5-point Likert scale. The scales were constructed in consultation with content experts. Scales were discussed in two think-aloud groups of experienced teachers and revised after each session. Between the first and second sessions, the survey was piloted. Internal consistency between items was measured using Cronbach's alpha, and items scored below 0.7 were removed.

Population and non-response analysis

In 2021–2022, 5,417 teachers taught history in Swedish upper secondary schools. Of these, 3,951 held a legitimation, a requirement for grading students and permanent employment. Based on data from the National Agency for Education, schools were classified into three groups according to their socioeconomic status: low, average, and high. Within each group, 40% were randomly selected. Schools were contacted, and 1,833 email addresses were collected. The final selection covered 33.7% of all history teachers; Of which 87.6% (n = 1695) worked at public schools and 12.4% at private schools (n = 228).

The answer frequency was 29.5% (n = 540). Teachers from high-ranking socioeconomic schools, urban areas and female teachers had a slightly higher answer frequency. Moreover, there was a geographical predominance towards southern Sweden, which aligns with population distribution. Answer frequencies are well distributed among the groups, except teachers without legitimation, who constitute 27.1% of the population, but only 7.6% of the answers.

Analytical procedure

The primary analysis of the survey used descriptive statistics by comparing means. To check for significant differences, independent samples T-tests were used. This study compares means and calls for an extended discussion containing effect sizes in further articles. For analytical reasons, technology is differentiated into *generic* and *content specific*. This is inspired by Sofie Nilsson (2021) and will work as a scaffold to describe distinct types of technology and their purposes.

Grouping of teachers

Teachers were divided into two groups to assess their approaches to digital tools and history teaching using the items in the survey, checking for the TPACK intersection and those about using digital tools.

An exploratory factor analysis was conducted, and two factors explained 69% of the variation. Items that did not load were removed. The remaining items were recalculated with a dichotomous scale (0–1) and checked for internal consistency using Cronbach's alpha (α = 0.893). All selected variables contributed to consistency (varying from 0.880 to 0.889). Variables were used to construct a digitalisation index *(di)*. The teachers were divided into two groups using the median value from this index: one group with teachers who work more with digital technology and one with teachers who work less with digital technology.

4. Results

In this section, the results are presented. They are structured around the three primary constructs in the TPACK model: content, pedagogy and technology.

Content

Questions about content are structured into three subsections: a) the purpose of history teaching, b) the content being taught, and c) the orientation of the history being taught. These connect to the content construct of the TPACK model.

a) Purpose of history education

All the purposes of enquiry, except one, scored high (4.28–4.75), indicating that teachers regard many purposes as important. However, the objective to *participate in cultural heritage* stands out with a low score (3.61).

The highest-ranking purposes were explaining *current events* and *understanding current and past social structures* and *historical knowledge*. In short, the past and the present are deemed more important than future dimensions, emphasising practical and current relevance in history teaching. Differences between more or less digital teachers are small but significant, where digital teachers score higher. The most considerable disparities were found in *thinking critically* and *participating in society*, even though the distinctions seemed limited. Connecting to the narrative approach, the focus lies on the experience dimension rather than on the interpretative or orienting dimensions.

b) Content of history

Earlier research has shown a solid canonical tradition (Eliasson & Nordgren, 2016; Lozic, 2010), aligning with this study's results. Even though the curriculum gives teachers much freedom to focus on what they deem essential, the results indicate conformity. The upper quartile consists of six areas of historical content. Five are connected to the Second World War, with the Holocaust as the most prioritised area. Simultaneously, other historical examples of genocide and oppression score low, together with the emergence of ancient civilisations. The prioritised areas also reveal a solid Eurocentric narrative consistent with earlier research (Eliasson & Nordgren, 2016; Lozic, 2010), albeit the current curriculum focuses on Western history.

Differences between more and less digital teachers are small but primarily significant and follow the same pattern. The most considerable divergence is in teaching about European colonialism and the slave trade. In all the cases examined, teachers working more with technology scored slightly higher.

c) Orientation of history

The Swedish history syllabus states that history teaching should develop students' historical knowledge and consciousness, highlighting the orientation of history teaching connected to the narrative competencies described by Jörn Rüsen (1988, 2005).

The results in Table 2 illustrate that teachers consider teaching *facts* as the most important (4.29), while *historical sources* (3.30) and the *use of history* (3.06) score notably lower. Group differences are small but significant, whereas digital teachers score higher in all three areas. The smallest distinction was found in teaching *historical facts*, indicating a consensus on the importance of teaching facts. Thus, there is an apparent emphasis on the experiential dimension of history.

	M	*di Low*	*di High*	*Dif.*
Historical facts	4.29	4.15	4.41	-0.25***
Historical sources	3.30	3.06	3.51	-0.44***
Use of history	3.06	2.87	3.23	-0.37***

**** The mean difference is significant at the .001 level.*

Table 1. Orientation of history teaching.

Asking for the use of historical concepts, those connected to historical facts, *cause and consequence* (4.54) and *concepts connected to content* (4.29) scored the highest. Meanwhile, the more abstract *long lines of history* (3.59) and *continuity and change* (3.49), both connected to the orientation dimension of history, scored lower. This result is consistent with both groups. Comparing the groups, more digital teachers scored higher on average. The smallest disparity can be found regarding *cause and consequence,* while *continuity and change* have the most significant differences.

The results combined indicate that the orientation of history teaching has a clear focus on the experiential dimension of history. Doing so puts both the orienting and interpretation in the back seat, creating a focus where tangible values are prioritised over the abstract.

The construct of content

In conclusion, the content construct shows a solid canonical tradition with a clear focus on the experiential dimension of history. Neither purpose, content, nor orientation differs from this. There are variations between more and less digital teachers in all three areas, but they are small and follow the same pattern. Both working with sources and using history score low. Furthermore, scores on historical concepts related to the interpretation and orientation dimension reveal that teachers do not prioritise this. This could limit students' ability to connect the past, present and future. However, there is an indication

that more digital teachers emphasise using historical sources in their teaching, which could mean disparities in how they present a narrative structure.

Pedagogics

The second construct of the TPACK model is pedagogics. When examining how history is taught through *lectures*, both *longer* (3.66) and *shorter* (3.60) score high, together with *individual work with textbooks or assignments* (3.66), *discussions in small groups* (3.59) and *discussions in class* (3.56). The differences between more and less digital teachers are small but mainly significant. The two most notable divergences are using *individual work with the internet* (3.12) and *cross-disciplinary or thematic assignments* (2.34), where digital teachers score notably higher.

Checking for teaching orientation and correlating content and pedagogics, lecture methods dominate teaching *facts*, while teaching *sources* and the *use of history* lean towards shorter lectures and more discussions. Methods that draw from a more student-centred teaching style score low, while more teacher-centred instruction seems favoured. This pattern overlapped in both groups.

Technology

The third construct in the TPACK model is technology. Results prioritise digital tools in both groups of teachers. Among digital tools, the focus leans towards generic digital tools. The most-used tools in both groups are *presentation tools* (4.23) and *cloud services for sharing* (4.11), considered generic. The highest-scoring content-specific tools are *movie/tv facts* (3.79) and *study questions* (3.54).

The differences between the groups were limited. Four of the five most-used tools exist in both groups, but in varying order. Analogue teachers use *analogue textbooks* to a larger extent, and digital teachers use more *digital reference materials.* Since digital textbooks score low among digital teachers, this could mean that they use free online resources rather than textbooks. The most significant variations between the groups can be found using *digital textbooks*, *historical sources* and *quiz services*.

Open-ended questions in the survey strengthened this image. Cloud services, presentations, digital tasks and digital textbooks are frequently mentioned. More content-specific tools, such as timelines or maps, are hardly mentioned. In general, content-specific tools are less prioritised than generic tools. The digital tools used are connected to lecture-based teaching. Tools that challenge this pedagogy, such as podcasts or visualisations, are mentioned in a few answers. They do exist, but are very rare.

According to research, one of the most apparent benefits is the abundance of digital sources. However, working with sources scored low, especially among teachers working less with technology.

Combining the constructs

The TPACK framework consists of three primary constructs and their intersections. In the survey, there were questions about these overlapping constructs.

Enquired about technology in specific areas, 107 teachers answered the open-ended questions. Four content areas dominated. World wars and historical sources were at the top, sometimes in combination. These were followed by use of history and the period after World War II. There is a focus on a few areas here, and even if historical sources and the use of history score high, there is a factual focus. Technology is mainly used when teaching facts, while less so in sources and the use of history. Even though it is possible to spot differences between content areas, long lectures and textbooks tend to be prioritised when teaching facts.

The open-ended questions do not support the claim that teaching with digital technology changes teaching, but instead, it is the same teaching but with different tools. Nor does technology move history teaching away from a focus on the experiential dimension; instead, this strengthens the focus on this dimension.

Checking for technology in relation to teaching methods suggests that technology is most used in longer lectures, a trend that is consistent across both groups, with only minor differences observed. Moreover, teachers generally perceive digitalisation to have an average (3.75) effect on their teaching, with a more substantial impact on the forms of teaching employed. However, there was a significant difference between groups, where more digital teachers reported a more significant impact on their teaching.

The results do not suggest other systematic differences in teaching history than previously reported. The choice of methods with and without a content dimension displayed the same pattern. Teaching mainly relates to lectures, sharing material and working with study questions or textbooks. The method changes when the subject's orientation comes to mind, rather than how much technology teachers use. Instead, a change occurs when checking for the overlap between content and pedagogy. Technology is used mostly when teaching facts and least when teaching the use of history. Even though there are variations between the groups of teachers, they tend to follow the same pattern regarding the three included constructs: content, pedagogy and technology.

5. Discussion

This study has explored the teaching practices of lower secondary-school history teachers in Sweden. The focus has rested on how content and methods diverge between teachers regarding the amount of digital technology they use in teaching and how their practice can be understood in relation to technology.

Content and methods

This study uses Jörn Rüsen's narrative framework. This framework is a foundation for the Swedish history syllabus hence being essential for Swedish history teaching. The results show a clear dominance of teaching connected to Rüsen's experiential dimension of history and the predominance of a stable tradition of teaching methods where a content-based lecture-style pedagogy is combined with study questions or textbooks, analogue or digital.

The emphasis on this experiential dimension rather than interpretation and orientation reveals the limitations of how the history syllabus is implemented in teaching. This risks limiting students' understanding of history as a continuous and interconnected narrative and their opportunities to develop their historical consciousness and perception of the relevance of history to their present and future. The canonical tradition amplifies this pattern, focusing on historical facts rather than historical sources, the use of history and concepts related to history's interpretation and orientation dimensions. The pattern is the same regardless of whether teachers are more or less digital, even though more digital teachers generally score higher.

A view of the three elements of the content construct, historical content, purpose and orientation demonstrates the same pattern, where more digital teachers have higher scores on all three areas. Furthermore, results strengthen the image of history education with historical facts connected to a few dominating areas in a clear dominance.

This study does not confirm that digital technology leads to new perspectives. Instead, more and less digital teachers tend to value the same historical content, even though a slightly more positive approach to historical sources amongst more digital teachers could mean another approach to the narrative structure. However, further research is needed to draw valid conclusions.

Understanding teaching and technology

The use of digital technology enhances the image of teaching focused on transmitting historical facts. Presentation tools and cloud services for sharing content and using study questions show that teaching has been primarily changed on the outside. Teaching still targets transmitting content via lectures. The differences between the two teacher groups illustrate that general differences are limited.

When examining teaching methods and digital tools, it is possible to trace a tendency for teachers working more with digital technology to lean towards more student-centred teaching. This tendency is limited but significant and could reveal a connection to how digitalisation could affect history teaching. However, this paper does not illustrate whether technology or other factors are the driving forces.

Instead, this could indicate underlying attitudes and beliefs about how teaching should be executed rather than teachers' historical knowledge, pedagogical competence or use of technology. Based on this, these differences may exemplify that this group of teachers is more inclined to use digital technology.

TPACK in application: Transformative or integrative?

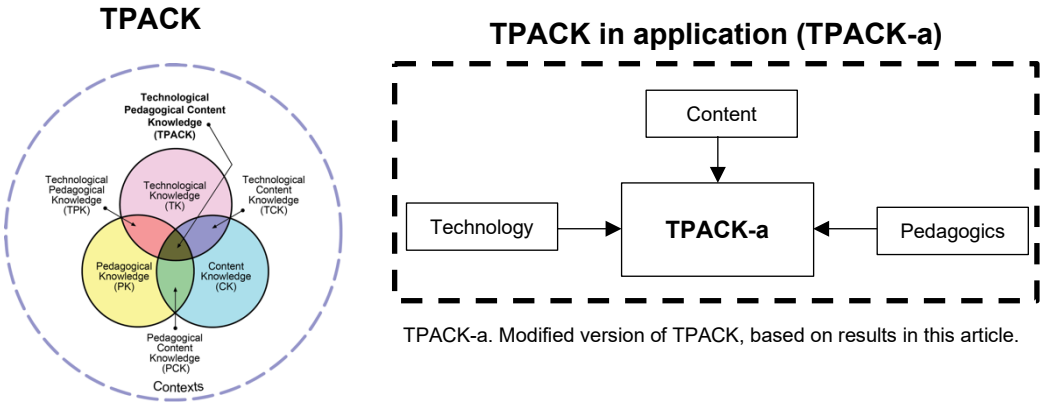
This study aligns with previous research that calls for revision of the TPACK model. Limited variations between groups and the fact that they largely follow the same pattern do not support a model in which constructs merge into a new, transformed practice. Instead, the constructs seem to work separately.

Earlier research that has tried to define TPACK as a single concept concluded that this is challenging, if possible at all (Gomez, 2016). Correspondingly, there is a need to develop the TPACK model in relation to teachers' practices.

Theoretical discussions connected to the PCK framework have presented two approaches: transformative and integrative. Instead of treating PCK as a transformed form of knowledge, the integrative approach treats PCK as a combination of interacting parts (Gess-Newsome, 1999).

I would argue that an integrative approach to TPACK is needed to make the model useable for studying the countless expressions of teachers' practice. An integrative approach facilitates the analysis of teachers in practice by focusing on each of the interconnected constructs and highlighting their importance and explanatory functions.

To comprehend the interaction of technology in history teaching, an approach is required that studies each element. I propose a modified model, *TPACK in application (TPACK-a),* in which content, pedagogy and technology are separated. The focus is on understanding their interactions in practice rather than seeking a transformed whole.



Original TPACK model. Reproduced by permission of the publisher, © 2012 by http://tpack.org

TPACK-a. Modified version of TPACK, based on results in this article.

Figure 1. TPACK and TPACK-a.

6. Conclusions

The main conclusion of this study is that the implications of digital technology in relation to Swedish history teaching have a limited impact on teaching practices and historical competencies, with little or no evidence of transformation or qualitative differences in teaching, nor does it challenge the canonical tradition within history teaching. Technology is mainly integrated into existing teaching rather than transforming it. This leads to the conclusion that a framework that emphasises all parts of history education is needed to fully understand how teaching works in relation to technology. Consequently, a suggestion on how to adapt the TPACK model is made.

The lack of change in teaching and substantial conformity suggests that digitalisation in Swedish schools is more of an organisational reform than a pedagogical one. However, this does not necessarily reflect what happens in the classroom. The results are limited to how teachers describe the methods and material used, and further research is required to explore potential differences in the practical use of technology.

Further research about attitudes and beliefs among teachers who work more with digital technology is needed. This could help determine underlying factors that affect how they use technology in teaching.

Based on this study, the question still must be answered whether and how digital tools can enhance methods, develop history teaching and bring new perspectives to the classroom, hence making history teaching more inclusive and meaningful for all students.

7. Acknowledgment

This text is based upon my presentation at the *XXII Congreso Internacional Jornadas de Educación Histórica. Pensamiento histórico, compromiso cívico y alfabetización digital* at *University of Murcia*. I want to thank the organisers for the opportunity to present my research during the conference and for the insightful discussions concerning my presentation.

I want to thank the teachers who took part in the survey. Their valuable contribution and cooperation were vital in providing insights into the educational landscape. Their willingness to participate made this research possible. The study has followed proper ethical standards set by the *Swedish Ethical Review Authority* ensuring anonymisation of respondents and their school affiliation.

Additionally, it is important to acknowledge the limitations of this study. The conclusions drawn are based on specific methods and data utilised. There is a possibility that conclusions need to be revised if more intricate data analysis methods are employed.

Therefore, further examination and exploration of the data are needed to enhance and nuance the conclusions.

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