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COMMERCIALIZATION AND COMMUNITY-BUILDING IN EXAM-CENTRIC EDUCATION ON YOUTUBE: AN ANALYSIS OF TURKEY'S LEADING EDUCATIONAL CHANNELS

(Research article)

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Abstract

The rise of digital platforms has ushered in a new era for educational delivery, with YouTube emerging as a significant player. This study provides a critical analysis of Turkish-language educational channels on YouTube, with a particular focus on their role in subject matter teaching for varying educational levels. We delve into the structure, operational dynamics, and content production approaches of these channels to offer empirical insights into their nature within the Turkish educational landscape. Employing document analysis method, this study scrutinized 17 prominent channels, identified through their high viewer engagement and subject matter teaching focus, to compile the data set. We analyzed these channels through inductive thematic content analysis approach. The findings offer a view of the channels' quantitative metrics, educational levels and subjects, content focus, purpose and organization, accessibility and interaction features, media and material usage, and viewer-directed links. Our discussion synthesizes these findings under four themes: YouTube's emergence as a potential alternative to in-person teaching, the role of community building in digital education, the prevalence of exam-centric educational engagement, and the nuanced implications of commercialization in online educational content.

Keywords: Commercialization; Exam-centric education; Community-building, Digital platforms; YouTube channels

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1. Introduction

Since the beginning of 21st century, social media has experienced rapid evolution, significantly influencing many facets of daily life. Initially, platforms like YouTube primarily facilitated personal sharing, entertainment, and social networking, as noted by Boulaire et al. (2010). People engaged with these platforms to share moments of their daily lives, interests, and thoughts. However, over time, the potential of social media began to be harnessed for a broader spectrum of purposes. Video-based platforms, particularly YouTube, led this evolution. Although the social media has incepted as a domain for purely entertainment purposes, it has gradually transformed into vital resources for education, learning, and personal development.

YouTube present unique opportunities for education. For example, Tadbier and Shoufan (2021) describe YouTube as a global platform with a diverse range of educational content, accessible from any geographical location and hence acts like a global virtual classroom. These researchers argue that the platform has diverged from traditional in-school teaching approaches with an inclusion of a variety of subject matters. Through video content, educators and teachers can share information related to school subjects in a visually and auditorily engaging manner, which serves to simplify complex subjects and topics for better understanding. By transcending the traditional classroom setting, YouTube channels focusing on subject matter teaching offer students the opportunity to learn at their own pace and convenience from any place that they can reach.

While comprehensive studies have explored various aspects of YouTube as an educational tool, they primarily focus on the content and its direct recipients. These research efforts, as identified by Shoufan and Mohamed (2022) in an extensive review on 647 publications, have addressed themes such as content creation and assessment, user attitudes and acceptance, usage strategies and behaviors, and the impact on student learning. The review concluded that YouTube is a rich, free, and enjoyable learning resource but is best suited for guided learning where teachers curate or create content within a well-defined pedagogical context. As this review suggests, although YouTube has been extensively studied as a platform for subject matter teaching, the research fell short in exploring the channels that curate and distribute this content, a gap noted in the literature but remains insufficiently addressed (see Liddle et al., 2022; Petryk, 2021).

This study seeks to bridge this gap by providing a focused analysis of Turkish-language educational channels on YouTube, particularly those that concentrate on subject matter teaching

across different grade levels. In this connection, this study will address the following research questions.

1. How are Turkish YouTube education channels organized and structured on this digital platform?
2. Within what scopes are educational contents on YouTube channels created, and what purposes do these scopes aim to serve?

Through these research questions, we aim to reveal the structure, operation, and content production approaches of these channels and to provide empirical insights into their nature. Our goal is also to enrich the understanding of the subject matter content presented in Turkish YouTube educational channels. Our considerations have the potential to contribute to the ongoing discussion about digital learning through our exploration of how YouTube channels are structured and organized within distinct learning ecosystems. In the following section, we will provide a literature review pertinent to our research theme.

1.1. Literature Review

The emergence of YouTube as an instructional platform has brought with it a new dimension to the instructional and educational practices. This has become particularly evident during the COVID-19 pandemic. In this regard, Ziaulhaq (2022) sheds light on the effectiveness of YouTube, especially during the COVID-19 pandemic when the closure of schools necessitated alternative educational approaches. The platform's engaging video content became a crucial resource at those difficult times and helped students to keep on the track with their schooling. Similarly, Samosir et al. (2018) identified YouTube as a significant aid for students, enhancing their grasp of educational materials and supplementing their academic pursuits. Further exploring this integration, Jones and Cuthrell (2011) address how YouTube videos can be effectively incorporated into teaching. Their findings pointed out the enrichment of learning experiences in social studies and primary education through the use of video content. These studies collectively suggest that YouTube’s educational influence extends beyond simple content provision; it acts as a dynamic tool that strengthens the learning process, widens access to educational content, and introduces diversity in instructional techniques.

YouTube was reported to have a transformative role in education and hence considered to be a viable alternative to traditional classroom instruction. Seo et al. (2018) have demonstrated the platform’s capacity to augment traditional education, offering advantages such as round-the-clock availability, autonomous pacing of learning, and enhanced understanding through diverse multimedia resources. Kevin and Hargis (2010) argue that YouTube's repository of audiovisual content is tailored to match different cognitive skill levels, supporting the proposition that such materials can bolster engagement in complex subjects like Chemistry (Ranga, 2017). Nonetheless, Soler et al. (2019) and Wang and Chen (2020) note that YouTube, while an excellent resource for preliminary and supplementary learning, is not a stand-alone replacement

for instructional approaches. Recognizing its value, YouTube is often regarded as an enrichment tool, one that complements and enhances the traditional teaching experience with its visual and auditory learning aids (Soe et al., 2018). Hence there appears a consensus in current research that YouTube serves a supportive and augmentative role in education but is not a full substitute.

Given that YouTube plays a supportive role in educational settings, it is hence important to consider the platform's impact from the user's perspective, especially with regard to subject matter teaching. From this perspective, two key insights are particularly worth noting: firstly, YouTube was found to increase independent learning and motivation; secondly, this increase is often associated to the pursuit of improved exam preparation and academic achievement. Several studies have reported an increase in students' proficiency with subject matter when they engage with YouTube for self-study, primarily motivated by the desire to improve exam performance and elevate achievement scores. For instance, Isnaini and Azhar (2021) explore how YouTube relates to student learning autonomy and they found a positive association. Their research underscores YouTube's role in advancing self-directed learning, which in turn improves students' independent learning skills. Furthermore, Aulia and Asyhar (2022) investigate YouTube's capacity to not only inspire learners but also to lead to tangible improvements in different subject matters and affirmed the platform's contribution to academic success. Reflecting this trend, the study by Cardoso, Kato and Oliveira (2014) indicate that students increasingly gravitate towards YouTube as a study aid during examination periods, suggesting that the demand for educational content on the platform intensifies when exams approach. In a similar vein, Klinger and Walter (2022) observe that students commonly seek out YouTube content in an effort to enhance their preparedness for examinations.

Our considerations thus far have predominantly concentrated on the implications of YouTube from the user's perspective. However, there is also a substantial body of research dedicated to understanding the motivations of content creators on this platform. These investigations have illuminated key incentives that drive creators to publish on YouTube. As corroborated by our earlier literature review, YouTube has established itself as a powerful medium for education and knowledge dissemination, attracting a diverse array of creators eager to share their expertise in various domains. Maynard (2021) highlights that the platform empowers educators, professionals, and enthusiasts to share their knowledge with a wide audience, effectively democratizing access to information and education.

Another compelling reason, as identified by Broxton and Khroustaleva (2012), is the conducive environment YouTube offers for personal expression and creativity. The platform serves as a canvas for creators to engage their audience with content that resonates on a deeper level. Furthermore, the concept of 'flow', the intrinsic joy found in the act of creation, emerges as a pivotal motivator for content producers to share their insights, emotions, and artistic

endeavors, a phenomenon Chun (2008) recognizes as a significant driving force for content generation.

Content creation on YouTube at times reflects as a collective endeavor. This relates to emergence of YouTube as a pivotal platform for community-building and social interaction. Forgeard and Mecklenburg (2013) point out this aspect and note that creators draw inspiration from the opportunity to form connections with peers who share their enthusiasm, which in turn fosters the growth of supportive and inspiring networks. These networks represent collaborative environments with influences beyond their digital scope. It is hence sensible to think that YouTube has grown into a place where unique communities flourish, each with its own style of interaction and distinctive characteristics. The researchers such as Burgess et al. (2020) emphasize that these groups represent more than just aggregations of like-minded individuals; they are incubators for new forms of literacy and social behaviors, often marked by a 'vernacular expertise' that is emblematic of the YouTube ecosystem. This represents a shift away from conventional knowledge paradigms and modes of interaction.

Regarding YouTube's diverse communities, Rotman et al. (2009) observe that a sense of unity arises from shared interests rather than official partnerships. The authors further go on to state that these shared interests pave the way for the creation of distinct identities within the community. Dewi and Simanjuntak (2017) further extend this observation noting that members often adopt unique usernames and avatars, actively engage with one another, and contribute to the development of a digital culture with its own set of standards and values. When this culture viewed from the perspective of community of practice in the work of Little (2002), it can be concluded that this trait is also evident in professional groups composed of educational professionals including practitioners and researchers. Here, YouTube serves as an extensive source of pedagogical content as well as encourages innovation in teaching and learning approaches, a situation that could be observed in the lively interactions among educators in digital platforms.

In the education sector, YouTube offers a significant opportunity to generate revenue for educators and content creators, hence transforming content creation from a mere hobby into a sustainable career. Researchers such as Hoiles et al. (2017) provide evidence that financial incentives are among the key motivators for producing educational content. The lure of financial gain on YouTube is greatly enhanced by the prospects of academic recognition and professional prestige. These forms of acknowledgment not only lead to financial benefits but also elevate an educator's recognition within the academic world. Amalia and Satvikadewi (2020) share this observation and further argue that the dual appeal of monetary and professional prestige serves as a strong incentive for content creators on the platform. They acknowledge the platform's ability to offer significant rewards for personal career growth and increased public visibility. Furthermore, as Nurmalasari and Masitoh (2020) have highlighted, educational institutions are utilizing YouTube strategically for marketing purposes by publicizing their successes and educational programs on the platform. In so doing, they attempt to increase their visibility and

appeal to potential students. All these research findings point to the fact that YouTube's economic potential is driving the evolution of a decentralized educational model, enabling creators to share knowledge without the constraints of traditional educational frameworks.

The literature review that we presented until now reveals four key insights into how YouTube have impacted education. First, YouTube has begun to constitute as an alternative to conventional classroom teaching. Research has made it clear that YouTube introduces a new way of learning that goes well beyond physical classroom limits in a digital environment where knowledge is always available and accessible to everyone. Second, YouTube has introduced a shift towards the way in which students engage with the subject matter content for learning. It allows for independent learning, with increasingly more students using the platform to improve their academic achievement, especially as reflected in exam scores. This move towards self-guided learning indicates a significant change in student attitudes and preferences. Third, YouTube is laying the groundwork for the formation of its own peculiar educational communities. In these online spaces, content providers and students exchange knowledge, challenging and reshaping the traditional social structures of education. They support a collaborative approach to learning and information sharing that goes beyond the confines of traditional education. Finally, the opportunity to monetize educational content on YouTube is a powerful incentive for content creators who capitalize on YouTube's wide reach to disseminate their expertise and, at the same time, earn revenue from their educational offerings.

2. Method

In this study we employed document analysis method, which involves a systematic approach for reviewing or evaluating documents—both printed and electronic. This method is defined as a systematic examination of existing records or documents as a source of data (Patton, 2014). Document analysis encompasses a series of processes involving both the scrutiny and interpretation of material, allowing for a comprehensive understanding of the subject matter (Bowen, 2009). For the purpose of our study, various forms of content available on YouTube channels have been considered as documents. The documents, as Bogdan and Biklen (2007) clarify, include all written, visual, auditory, and technical content that these platforms offer. Our investigation has been centered on an examination of these documents as presented on the educational channels operating on YouTube, aiming to distill and analyze the qualitative data they provide. In the rest of this section, we will detail the constitution of the data set and elucidate our data analysis methods.

2.1. Data set

The present study is part of a wider research into the educational content provided on YouTube, with a particular focus on mathematics instruction. In the initial phase of the broader research, our objective was to identify the most influential Turkish-language mathematics teaching videos on YouTube, based on their viewership numbers. To achieve this, we

implemented a methodical selection process, guided by specific criteria that aimed to capture the content's relevance to school mathematics education, language, and popularity.

While constructing the dataset for the study, we first selected a search strategy. We utilized 'matematik' as the primary keyword and conducted a search directly within YouTube. This search yielded a number of videos focusing on mathematics instruction. We then selected videos in the Turkish language in order to ensure cultural and linguistic relevance to our research context. We later ranked these videos based on their view counts, which indicate their popularity and reach within the educational segment on YouTube. This ranking allowed us to isolate the top 100 videos that not only covered the subject matter of school-level mathematics but had also received the most attention from viewers, suggesting a high level of engagement and impact.

From the collection of the most-viewed videos, we have chosen 17 unique channels distinguished for publishing content with high levels of viewer engagement. These channels subsequently formed the dataset for our in-depth examination. Importantly, these channels were selected for their emphasis on subject matter teaching pertinent to school education across a variety of grade levels. Such selection process ensured that the channels under examination were not only popular but also substantively contributed to structured educational content, addressing the learning requirements of students at different stages of their schooling.

2.2. Data analysis

We examined the YouTube channels through inductive content analysis technique inspired by Corbin and Strauss's (1990) principles of open and axial coding. This reflects a grounded approach to data analysis which enables researchers to come up with codes and themes relevant to the research focus. While analyzing the data, two researchers from our team worked together to explore the structure and substance of the channels. Initially, both researchers got independently involved into a detailed examination of all the channels to become familiar with the data, and they repeatedly reviewed the content to ensure a comprehensive understanding. During this exploratory phase, they recorded detailed notes on various features observed within the channels.

Subsequent to this individual examination, the researchers convened to consolidate their observations. This collaborative discussion served to compare and, where appropriate, integrate their findings, resulting in a preliminary framework for content analysis. Through iterative discussions, the code definitions were extracted and emergent themes around these codes were refined. The full-sample analysis involved revisiting earlier observations and implications, refining them as the analysis advanced, characterizing the content analysis as an iterative, reflective, and recursive process.

Throughout the span of the analysis, periodic meetings were held between the coders to reflect on, and critically evaluate, the emerging codes. This rigorous process was sustained until a consensus was reached on the coding schema. In parallel, both researchers engaged in

discussions to contextualize their findings by drawing upon relevant literature to deepen the understanding of the data. This process ensured that the analysis was both grounded in the data and informed by the existing body of scholarly work, allowing for a rich and nuanced interpretation of the educational content provided by the YouTube channels under study. In what follows we briefly describe the extracted codes, which were collected under six themes: quantitative metrics, educational levels and subjects, content descriptors, accessibility and interaction features, media and material usage, and links.

1. Channels' Quantitative Metrics: This theme relates to the basic quantitative metrics that provide a snapshot of a channel's reach and popularity. Under this theme, we focus on channels' inception dates, subscriber count, and view numbers. This data was often displayed on the channel's 'About' page or accessed through analytics features provided by YouTube.
2. Educational Levels and Subjects: This theme refers to the specific educational tiers (such as primary, secondary, or high school) and the academic subjects (like mathematics, science, or literature) that the channels focus on. This information was gleaned from the content of the videos themselves, video descriptions, channel descriptions, or any playlists that are organized by grade level or subject area.
3. Content Descriptors of Channels: This theme specifically focuses on three critical aspects: Focus, Purpose, and Organization. Focus refers to the central theme or main subject matter around which the channel's content was developed. Purpose concerns the intended goal or objective behind the content. Organization outlines how the content within the channels is structured. Details of each code is as follows:
    a. Content Focus: Typically involves direct subject instruction or solving exercises.
    b. Content Purpose: Mainly categorized into two types - preparation for centralized exams (like national entrance exams) and school exams.
    c. Content Organization: Identified in three main styles:
        i. Sequential exam-based organization: Systematic series covering entire exam syllabi.
        ii. Individual independent videos: Standalone videos on specific topics without a sequential order.
        iii. Sequential topic-based videos: Series focusing on the same subject, usually covering extended topics in several interconnected videos.

3. Accessibility and Interaction Features: This theme is concerned with the overall accessibility and interaction quality of the educational channels. Data for these descriptors was gathered through direct observation of the channel features, video attributes, and the presence of interactive elements as indicated in the YouTube video player and page metadata. The features are defined and coded as follows:

a. Video Production Method: This refers to the way videos are created and delivered to viewers as either Synchronous or Asynchronous.
b. Interaction through Comments: It was determined whether comment feature is enabled for viewers to interact with the content creators or not.
c. Enhancing Video Accessibility: Two such features coded were subtitles and transcripts.

5. Media and Material Usage within the Channels: The data for these descriptors were gathered through direct observation and analysis of the educational content and the associated materials provided within or linked from the videos. The following descriptors have been coded based on the types of media and materials used:

a. Text: This includes various types of text-based materials such as lecture notes, examples, questions, etc., shared within the video content itself or through links to PDF files, social media, books, and websites provided in the video descriptions.
b. Visuals: Refers to images, cartoons, photographs, and other visual aids used within videos to support the teaching process and enhance viewer engagement and understanding.
c. Digital Media: Encompasses digital writing tools and surfaces, such as graphic tablets or digital whiteboards, where content is directly created or annotated digitally.
d. Stylus: A tool used with digital media to write, draw, or interact with the content on a touchscreen interface.
e. Color Pens: Utilized to highlight, differentiate, or emphasize various parts of the content, whether on paper or digital media.

6. Links Directed to Viewers: This theme examines the strategic use of links by content creators to broaden the educational scope beyond their YouTube videos. The creators' aim is to offer a seamless transition to various forms of additional content, whether for further study, practice, or community interaction. the following types of links have been identified.

a. Assignment of Homework Link: These are links that content creators provide to guide viewers to exercises and tests specifically designed to complement and reinforce the topics covered in the video.
b. Social Media Link (Instagram/X): These links connect viewers with the creator's presence on other social media platforms, encouraging community engagement, continuous learning, updates, and additional content that often includes motivational elements related to the educational topics.
c. Own Website Link: Such links direct viewers to the creator’s personal or official website, where they can access more in-depth, often paid, educational materials.

4. Findings

In this section, we present the results of our analysis according to the distinct dimensions of the YouTube educational channels we analyzed: the channels' quantitative metrics, educational levels and subjects, the channels' content focus, purpose and organization, accessibility and interaction features, media and material usage, and the nature of links directed to viewers.

4.1. The channels' quantitative metrics

The first theme concerns the channels' quantitative metrics with regard to their inception dates, subscriber numbers, and total view counts. This data was updated as of December 25, 2023, and presented in Table 1.

Table 1. The channels' quantitative metrics

Channels	Inception Dates	Subscriber Numbers	Total View Counts
Benim hocam (My Teacher)	2014	2.940.000	737.420.160
Rehber Matematik (Guide Maths)	2016	2.270.000	548.090.267
Tonguç 8. Sınıf (Tonguç 8th Grade)	2014	1.920.000	314.457.655
Şenol hoca (Şenol Teacher)	2011	1.500.000	361.028.452
Hocalara Geldik (We came to teachers)	2014	1.360.000	690.859.306
Tonguç 9. Sınıf (Tonguç 9th Grades)	2017	1.130.000	222.000.927
Tonguç 7. Sınıf (Tonguç 7th Grades)	2018	1.290.000	205.050.991
Tonguç 6. Sınıf (Tonguç 6th Grades)	2016	1.120.000	170.864.770
Tonguç 5. Sınıf (Tonguç 5th Grades)	2016	884.000	132.670.012
Tonguç 10. Sınıf (Tonguç 10th Grades)	2018	611.000	132.803.443
Tunç Kurt Matematik (Tun. Wolf Maths)	2016	621.000	71.528.806
Mert Hoca (Mert Teacher)	2019	761.000	148.624.511
Tonguç 11. Sınıf (Tonguç 11th Grades)	2019	307.000	63.256.704
Bulbulogretmen (Bulbul Teacher)	2016	232.000	58.403.797
SML Hoca (SML Teacher)	2018	203.000	13.563.440
Çılgın Profesör (Crazy Professor)	2020	54.700	9.563.356
Çocuğum Matematik (My Child Maths)	2013	23.200	9.489.814

Table 1 shows that a range of channels were established between 2011 and 2020, indicating a diverse age among the educational resources available on YouTube. Channels such as "Benim hocam (My Teacher)" and "Rehber Matematik (Guide Maths)" have substantial subscriber bases, with over 2 million subscribers each, suggesting a significant following in the online educational community. The total view counts are particularly telling of the channels' reach and impact, with "Benim hocam (My Teacher)" achieving over 730 million views, which showcases the immense popularity and the extent of its educational content's consumption. Other channels, while having fewer subscribers, also demonstrate considerable viewership, with "Hocalara Geldik" surpassing 690 million views. The channels target various educational levels, from 5th grade to 11th, as denoted by names like "Tonguç 8. Sınıf (Tonguç 8th Grade)" and "Tonguç 11. Sınıf (Tonguç 11th Grades)," suggesting content tailored to the curriculum of specific grades.

4.2. Educational levels and academic subjects

Table 2 provides a comprehensive overview of the educational levels and subjects covered by various Turkish educational YouTube channels. This table reveals a broad coverage across primary, secondary, and high school tiers. "Benim hocam (My Teacher)" demonstrates an extensive range of subjects, including Mathematics, Turkish, Social Sciences, Science, Religious Culture, and English, indicating a multi-disciplinary approach that caters to high school students. Similarly, "Tonguç 8. Sınıf (Tonguç 8th Grade)" and other Tonguç-related channels demonstrate a wide range of subject coverage but are more focused on the secondary educational tier.

On the other hand, channels such as "Rehber Matematik (Guide Maths)" and "Tunç Kurt Matematik (Tunç Wolf Maths)" appear to specialize primarily in mathematics, with the latter also providing content in other subjects, albeit to a lesser extent. Some channels, like "Bulbulogretmen (Bulbul Teacher)" and "SML Hoca (SML Teacher)," show a more targeted focus, with "Bulbulogretmen" contributing to primary education and "SML Hoca" to high school education, both in mathematics. Table 2 also illustrates the diversity within the Turkish educational YouTube community, reflecting a range of educational content that supports students across different levels of their schooling.

Table 2. Educational levels and subjects

	Educational Tiers			Academic Subjects						
Channels	Primary	Secondary	High School	Mathematics	Turkish	Social Sciences	Science	Religious Culture	English	Others
Benim hocam (My Teacher)			✓	✓	✓	✓	✓	✓	✓	✓
Rehber Matematik (Guide Maths)			✓	✓						
Tonguç 8. Sınıf (Tonguç 8th Grade)		✓		✓	✓	✓	✓	✓	✓	✓
Şenol hoca (Şenol Teacher)		✓	✓	✓						
Hocalara Geldik (We came to teachers)		✓	✓	✓	✓	✓	✓		✓	✓
Tonguç 9. Sınıf (Tonguç 9th Grades)			✓	✓	✓	✓	✓	✓	✓	✓
Tonguç 7. Sınıf (Tonguç 7th Grades)		✓		✓	✓	✓	✓	✓	✓	✓
Tonguç 6. Sınıf (Tonguç 6th Grades)		✓		✓	✓	✓	✓	✓	✓	✓
Tonguç 5. Sınıf (Tonguç 5th Grades)		✓		✓	✓	✓	✓	✓	✓	✓
Tonguç 10. Sınıf (Tonguç 10th Grades)			✓	✓	✓	✓	✓	✓	✓	✓
Tunç Kurt Matematik (Tun. Wolf Maths)			✓	✓						✓
Mert Hoca (Mert Teacher)			✓	✓						
Tonguç 11. Sınıf (Tonguç 11th Grades)			✓	✓	✓	✓	✓	✓	✓	✓
Bulbulogretmen (Bulbul Teacher)	✓			✓						
SML Hoca (SML Teacher)			✓	✓						
Çılgın Profesör (Crazy Professor)			✓	✓						
Çocuğum Matematik (My Child Maths)			✓	✓						

4.3. The channels' content focus, purpose and organization

Table 3 provides an overview of the content focus, purpose, and organization across the channels. The content focus is split between subject instruction and solving exercises, indicating channels' dedication to either teaching core material or guiding students through practical application via problem-solving. Many channels, such as "Benim hocam (My Teacher)" and "Rehber Matematik (Guide Maths)," offer a blend of both instructional content and exercise solutions.

Regarding content purpose, channels are differentiated by their focus on preparing students for centralized exams, such as national standardized tests, versus school exams, which are curriculum-based assessments typically conducted within schools. Channels like "Rehber Matematik (Guide Maths)" and "Şenol Hoca (Şenol Teacher)" provide resources for both types of exams.

In terms of content organization, the channels employ various approaches to structure their content. Some opt for sequential exam-based organization, presenting content in a series format that systematically covers the topics for an upcoming exam. Others favor individual independent videos, offering focused lessons on specific topics without following a sequence. Lastly, there are channels that provide sequential topic-based videos, where a series of videos are dedicated to thorough exploration of a particular subject, often spanning multiple videos.

Table 3. The channels' content focus, purpose and organization

	Content Focus		Content Purpose		Content Organization		
Channels	Subject Instruction	Solving Exercises	Preparation For Centralized Exams	School Exams	Sequential Exam-Based	Individual Independent	Sequential Topic-Based
Benim hocam (My Teacher)		✓	✓			✓	✓
Rehber Matematik (Guide Maths)	✓	✓	✓	✓	✓	✓	
Tonguç 8. Sınıf (Tonguç 8th Grade)	✓	✓	✓	✓		✓	
Şenol hoca (Şenol Teacher)	✓	✓	✓	✓		✓	
Hocalara Geldik (We came to teachers)	✓	✓	✓	✓		✓	
Tonguç 9. Sınıf (Tonguç 9th Grades)	✓	✓		✓		✓	

Tonguç 7. Sınıf (Tonguç 7th Grades)	✓	✓		✓		✓	
Tonguç 6. Sınıf (Tonguç 6th Grades)	✓	✓		✓		✓	
Tonguç 5. Sınıf (Tonguç 5th Grades)	✓	✓		✓		✓	
Tonguç 10. Sınıf (Tonguç 10th Grades)	✓	✓		✓		✓	
Tunç Kurt Matematik (Tun. Wolf Maths)	✓	✓	✓			✓	
Mert Hoca (Mert Teacher)	✓	✓	✓	✓	✓	✓	
Tonguç 11. Sınıf (Tonguç 11th Grades)	✓	✓	✓	✓		✓	
Bulbulogretmen (Bulbul Teacher)	✓	✓				✓	
SML Hoca (SML Teacher)	✓	✓	✓	✓	✓	✓	
Çılgın Profesör (Crazy Professor)	✓	✓	✓			✓	
Çocuğum Matematik (My Child Maths)	✓	✓	✓			✓	

4.4. Channels' accessibility and interaction features

Table 4 outlines the accessibility and interaction feature of the channels. The "Video Production Method" column indicates that all channels primarily use an asynchronous method, meaning content is pre-recorded and not streamed live, allowing viewers to watch at their convenience. "Interaction through Comments" is marked for all channels, suggesting that they actively engage with their audience through the comment sections beneath the videos. In terms of "Enhancing Video Accessibility," the majority of the channels provide subtitles and transcripts, making their content more accessible to a broader audience. Particularly, "Rehber Matematik (Guide Maths)" stands out for offering both synchronous video production, which includes live interactions, and asynchronous content, along with complete accessibility features like subtitles and transcripts.

Table 4. Channels' accessibility and interaction features

Channels	Video Production Method		Interaction Through Comments	Enhancing Video Accessibility	
	Synchronous	Asynchronous		Subtitles	Transcripts
Benim hocam (My Teacher)		✓	✓		
Rehber Matematik (Guide Maths)	✓	✓	✓	✓	✓
Tonguç 8. Sınıf (Tonguç 8th Grade)		✓	✓	✓	✓
Şenol hoca (Şenol Teacher)		✓	✓		
Hocalara Geldik (We came to teachers)		✓	✓	✓	✓
Tonguç 9. Sınıf (Tonguç 9th Grades)		✓	✓	✓	✓
Tonguç 7. Sınıf (Tonguç 7th Grades)		✓	✓	✓	✓
Tonguç 6. Sınıf (Tonguç 6th Grades)		✓	✓	✓	✓
Tonguç 5. Sınıf (Tonguç 5th Grades)		✓	✓	✓	✓
Tonguç 10. Sınıf (Tonguç 10th Grades)		✓	✓	✓	✓
Tunç Kurt Matematik (Tun. Wolf Maths)		✓	✓		
Mert Hoca (Mert Teacher)		✓	✓	✓	✓
Tonguç 11. Sınıf (Tonguç 11th Grades)		✓	✓	✓	✓
Bulbulogretmen (Bulbul Teacher)		✓	✓	✓	✓
SML Hoca (SML Teacher)		✓	✓	✓	✓
Çılgın Profesör (Crazy Professor)		✓	✓		
Çocuğum Matematik (My Child Maths)		✓	✓	✓	✓

4.5. The channels' media and material usage

Table 5 illustrates the media and material usage by the channels. Text-based content, such as lecture notes or problem sets, is widely used, with "Benim hocam (My Teacher)" and "Rehber Matematik (Guide Maths)" among the channels employing this format. The widespread use of text indicates a traditional approach to online teaching. Digital media usage is less common but still present. "Tonguç 9. Sınıf (Tonguç 9th Grades)" and "Çılgın Profesör (Crazy Professor)" incorporate digital tools into their content. Visual aids like images or diagrams are utilized by several channels, including "Tonguç 8. Sınıf (Tonguç 8th Grade)" and "Bulbulogretmen (Bulbul Teacher)," to support visual learning and perhaps make complex topics more understandable.

The stylus, a tool for digital annotation, is used by channels such as "Rehber Matematik (Guide Maths)" and "Mert Hoca (Mert Teacher)," indicating a modern approach to content creation where digital illustration is key. Color pens are used by nearly all channels to draw attention to key areas in more engaging and memorable ways.

Table 5. The channels' media and material usage

Channels	Text	Digital Media	Visuals	Stylus	Color Pens
Benim hocam (My Teacher)	✓				✓
Rehber Matematik (Guide Maths)	✓			✓	
Tonguç 8. Sınıf (Tonguç 8th Grade)	✓		✓		✓
Şenol hoca (Şenol Teacher)	✓				✓
Hocalara Geldik (We came to teachers)	✓				
Tonguç 9. Sınıf (Tonguç 9th Grades)	✓	✓		✓	
Tonguç 7. Sınıf (Tonguç 7th Grades)	✓		✓		✓
Tonguç 6. Sınıf (Tonguç 6th Grades)	✓		✓		✓
Tonguç 5. Sınıf (Tonguç 5th Grades)	✓		✓		✓
Tonguç 10. Sınıf (Tonguç 10th Grades)	✓		✓		✓
Tunç Kurt Matematik (Tun. Wolf Maths)	✓			✓	
Mert Hoca (Mert Teacher)		✓		✓	
Tonguç 11. Sınıf (Tonguç 11th Grades)	✓		✓		✓
Bulbulogretmen (Bulbul Teacher)	✓		✓		✓
SML Hoca (SML Teacher)	✓				✓
Çılgın Profesör (Crazy Professor)	✓	✓		✓	
Çocuğum Matematik (My Child Maths)	✓		✓		✓

4.6. The nature of links directed to viewers within the channel

Table 6 demonstrates how the channels utilize external links as part of their content strategy, serving to deepen engagement, reinforce their branding, and enhance their revenue streams through sales and marketing efforts. "Rehber Matematik (Guide Maths)" stands out with a holistic approach, leveraging nearly every category of link to foster a robust educational ecosystem. The presence of social media links across multiple channels, such as "Hocalara

Geldik" and "Tonguç" series, signifies an intent to create communities beyond YouTube to strengthen the ties within their educational network. The inclusion of own website links by channels such as "Tonguç 9. Sınıf (Tonguç 9th Grades)" and "Tonguç 11. Sınıf (Tonguç 11th Grades)" indicates an emphasis on branding and promotion. These links often direct the viewers to the platforms where channels have the opportunity to control their presentation and user experience in the digital space. A considerable number of channels, including "Şenol hoca" and "Tonguç 10. Sınıf (Tonguç 10th Grades)," feature links to their own sales portals where educational packages and books are offered. This indicates a clear focus on sales and marketing and clearly points to the channels' efforts to make monetary profits beyond the YouTube platform. By directing viewers to purchase additional materials, these channels are capitalizing on their educational content.

Table 6. Links directed to viewers

	Assignment of Homework			Social Media (Instagram/X)		Own Website	
Channels	Viewing of Different Sources	Exercise/ Test	Fascicules	Motivation/ Humor	Promotion/Advertisement	Sale of Educational Packages	Book Sales
Benim hocam (My Teacher)					✓		✓
Rehber Matematik (Guide Maths)	✓	✓	✓	✓	✓		✓
Tonguç 8. Sınıf (Tonguç 8th Grade)			✓	✓	✓	✓	✓
Şenol hoca (Şenol Teacher)				✓	✓	✓	✓
Hocalara Geldik (We came to teachers)		✓		✓	✓	✓	
Tonguç 9. Sınıf (Tonguç 9th Grades)			✓	✓	✓	✓	✓
Tonguç 7. Sınıf (Tonguç 7th Grades)			✓	✓	✓	✓	✓
Tonguç 6. Sınıf (Tonguç 6th Grades)			✓	✓	✓	✓	✓
Tonguç 5. Sınıf (Tonguç 5th Grades)			✓	✓	✓	✓	✓
Tonguç 10. Sınıf (Tonguç 10th Grades)			✓	✓	✓	✓	✓
Tunç Kurt Matematik (Tun. Wolf Maths)				✓	✓		
Mert Hoca (Mert Teacher)				✓	✓		✓
Tonguç 11. Sınıf (Tonguç 11th Grades)			✓	✓	✓	✓	✓
Bulbulogretmen (Bulbul Teacher)					✓		
SML Hoca (SML Teacher)				✓	✓		

Çılgın Profesör (Crazy Professor)	✓	✓
Çocuğum Matematik (My Child Maths)		✓

5. Discussion and conclusions

Our exploration of Turkish channels operating on YouTube platform has yielded insights that are pivotal to understanding the nuanced dynamics of this digital environment. In the following discussion, we attend to the intricate layers of our findings around four key areas: the potential of YouTube as an alternative to in-person teaching, the efficacy of community building efforts by educational channels, the prominence of exam-centric educational engagement, and the commercialization of education within this digital platform.

5.1. YouTube as an alternative to in-person teaching?

Our findings inform a nuanced debate in educational research concerning YouTube's role as an alternative to traditional in-person education. While our findings confirm YouTube's emerging status as a preferred learning platform among students, the academic discourse presents varying, if not contradicting, perspectives on this phenomenon. Our analysis, grounded in the metadata, indicates YouTube's transformation into a real alternative for classroom instruction. Students are increasingly turning to this platform for self-directed learning across various academic subjects, as evidenced by the significant viewership and engagement with educational content. This trend is aligned with Ranga's (2017) findings, which suggest that YouTube's self-paced learning can match or even surpass the outcomes of conventional education settings.

However, the variety in research outcomes calls for a balanced understanding. While Soler et al. (2019) recognize the supplemental value of YouTube in enhancing preparation for hands-on laboratory practices, they also maintain that traditional written materials retain their relevance. This highlights YouTube's role as a complementary tool rather than a wholesale replacement for traditional methods, suggesting that a blended approach might be most beneficial. In the context of language learning, Seo et al. (2018) observed the advantages of YouTube within a flipped classroom model, resonating with our findings of the platform's convenience and accessibility. This reflects a broader educational trend where digital platforms are being leveraged to create more flexible and engaging learning experiences, as also noted by Kevin and Hargis (2010) in their discussion of digital contents' alignment with Bloom's Taxonomy. Wang and Chen (2020) offer a caveat, pointing to the ambivalence regarding YouTube's efficacy for serious academic preparation despite its interactive nature. This echoes our observation that while YouTube is indeed an alternative, it does not negate the value of traditional in-person

education. Rather, it challenges the traditional practices to adapt and evolve by integrating new forms of content delivery.

Drawing upon these observations, we argue that YouTube has carved out a significant niche in the educational landscape. It is not merely a repository of information but a dynamic learning environment that caters to the contemporary student's needs for flexibility, engagement, and self-regulation. However, the richness of in-person interaction and the structured support provided by traditional education cannot be overlooked. Therefore, our discussion suggests that the future of education may not lie in choosing between YouTube and the classroom but in harmonizing both to enrich the learning experience.

5.2. Community-building efforts by educational channels

Our findings suggest that the socio-cultural and institutional structures are emerging on YouTube, particularly in the context of subject matter teaching. The channels analyzed in our study are not merely content providers; they are architects of expansive online communities that transcend physical boundaries, forging a socio-cultural and institutional presence in the digital realm. We agree with Burgess et al. (2020) when they assert that YouTube channels are engaging in a form of online enculturation, cultivating unique communities characterized by shared learning objectives and communal engagement. Our observations align with the insights of Rotman et al. (2009) regarding the intrinsic connections that bind online communities together on YouTube. The unity found among learners and educators on this platform seems to be rooted in a collective pursuit of exam-centric academic achievement, an issue which we deal in more detail in the following section.

The channels we have scrutinized act as platforms which creates its own digital culture with unique identifiers like channel names and personalized content. These features we argue foster a sense of belonging and identity. This is particularly evident in the way channels from "Tonguç 5th Grade" to "Tonguç 11th Grade" customize their branding and content delivery approach to attract the attention of different yet specific grade levels. Moreover, community-building efforts of these channels are also observable in their efforts to direct the viewers to particular sites by employing a mix of academic and social engagement strategies—from assigning homework and facilitating social media interaction to promoting various educational resources through links in their video contents. These strategies are employed not just to cultivate a community but also to create a culture unique to each channel, as seen with "Çılgın Profesör" (Crazy Professor) and "Benim Hocam" (My Teacher), whose names alone foster a sense of association and belonging. In light of our findings and observations, our argument is that the educational channels contribute to the evolution of learning by offering a community-driven educational experience.

This reflects a shift towards a more decentralized and participatory approach to education, which is not only about knowledge acquisition but also about community-building.

5.3. Exam-centric educational engagement

YouTube's educational channels have significantly produced exam-centric educational content. Our findings suggest that these channels are not merely filling gaps left by traditional education but are actively shaping the educational practice by focusing content around examination preparation. Reflecting the trends identified in our findings, YouTube channels are responding to an evident demand for exam-focused content, as evidenced by the high levels of engagement with videos related to examination subjects and techniques. This observation aligns with the work of Baer et al. (2021), who found that YouTube's educational content significantly boosts academic performance, particularly in mathematics—a subject heavily featured in standardized testing.

The influence of YouTube on student motivation and learning outcomes, particularly in mathematics, is further substantiated by Aulia and Asyhar (2022). In our analysis, we observed that channels with the highest viewership often provide content that is directly relevant to central or school examinations, indicating that YouTube is a preferred platform for students seeking to enhance their exam performance and success scores. Our findings also mirror the insights of Cardoso et al. (2014), where students turn to YouTube as a supplementary study tool during critical assessment periods. The content on these channels typically includes extensive problem-solving exercises and review materials that align with the curriculum tested in exams, suggesting that students find value in the platform's ability to provide targeted review and practice opportunities. Further to this, Klinger and Walter (2022) highlight the trend of secondary school students utilizing YouTube specifically for exam preparation, a finding that our study supports. We noted a significant increase in engagement with educational content on YouTube as students' progress through grade levels and face more complex and consequential examinations.

Reflecting on the body of research, along with the patterns observed in our study, it is worth noting YouTube's role in facilitating a new paradigm of educational engagement—one where independent learning is driven by the goal of excelling in examinations. YouTube channels have become instrumental in this shift, offering content that not only aids in understanding subject matter but also in mastering the 'art' of test-taking. As such, YouTube has evolved into a critical player in the education sector, at least in Turkish context.

At this juncture, it is crucial to acknowledge that the observations and implications drawn from our study are rooted in the context of Turkey. The pronounced shift towards exam-centric educational engagement on YouTube, as evidenced by the heightened focus on exam preparation content and the corresponding student interaction, reflects a significant trend within this national setting. While our study provides insights that may well resonate beyond Turkey, suggesting the potential for similar patterns to emerge in other educational contexts, we do not

presume to generalize our findings across all countries or YouTube channels globally. The specificity of educational culture and systems in different regions may yield varied dynamics in how educational content is consumed and valued on YouTube. Therefore, to substantiate the global relevance of our observations, we recommend the future studies to examine YouTube channels operating in countries with diverse educational cultures and systems to explore whether the trends we have identified in Turkey are indicative of a broader, international phenomenon. Such research would contribute to a more comprehensive understanding of YouTube's impact on educational engagement worldwide and offer valuable insights into the global evolution of digital learning.

5.4. Commercialization of education on YouTube

Our findings indicate a clear commercial motive among Turkish YouTube educational channels, particularly in the context of exam-centric content. This aligns with the concerns raised by Hamilton (2016), who cautions against the commodification of education. In the case of YouTube, this commodification may transform educational content into a marketable product, potentially at the expense of its dynamic and socially contextualized nature. This is echoed in our observation of channels focusing on content that is likely to attract more views and subscriptions. Conradie (2011) discusses the impact of consumerist perspectives on learning and teaching in higher education, a concern that extends to YouTube platform. Our study suggests that the commercialization of education on YouTube risks reducing knowledge to a product, tailored more towards market demands than educational integrity. This is evident in the content strategies of the channels, which prioritize exam-centric content that is most likely to generate revenue.

Our concerns center on the commercialization of YouTube's educational content, which carries the risk of pushing towards a standardized and narrow curriculum. Such a trend could transform education into a commodity, focused on test preparation rather than learning, and risk devaluing the essential nature of knowledge as a public asset. While channels on YouTube may seem to be building communities with the aim of enriching education, we feel it is necessary to approach these efforts with a caution. These community-building efforts, although they appear beneficial, could be intended to serve the motive of furthering the commercial interests of the content creators. Hence, we believe that the creation of communities around educational channels is not solely an educational pursuit but also a mechanism to cultivate loyal audiences, thereby enhancing monetization opportunities through increased viewership and potential sales of related educational products.

This development unites with the commercialization of the exam industry, where the preparation for and performance in exams become commodified, influencing both the nature of educational content and consumer behavior. YouTube, in facilitating this trend, becomes a marketplace where exam-centric learning is promoted, potentially at the cost of comprehensive, conceptual understanding. In our study, channels that focused on exam preparation attracted

significant traffic and this is a clear indication of the channels' role in supporting a performance-driven learning approach. Hence, we argue that the commercialization of education on digital platforms like YouTube should be critically examined to ensure that it serves the broader interests of learners and society.

Our final words concern the limitations of our study and the direction of future research. While our findings provide a detailed overview of Turkish educational channels on YouTube, they are specific to the Turkish context and cannot be generalized globally without further investigation. Future research should consider cross-cultural studies to examine similar channels in different educational cultures and systems in order to gain a more comprehensive understanding of YouTube's global educational impact. This will enable a richer discourse on the role of digital platforms in education and help shape policies and practices that prioritize the best interests of learners around the world. Further to this, in light of our findings, we recognize the need for further research to explore the long-term impact of YouTube's educational content on various aspects of learning. It is crucial to investigate how these digital practices affect students' critical thinking skills, conceptual understanding, and educational equity. Additionally, understanding the balance between educational benefits and commercial interests on YouTube will be crucial for ensuring that the platform's contributions to the educational sector are constructive and aligned with broader social values.

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Declaration of Conflicting Interests and Ethics

The authors declare no conflict of interest.

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