



Educational Content Dissemination, Microlearning, and Digital Citizenship: A Comparative Analysis of Spotify Podcasts and TikTok Short-Form Videos

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Abstract. This study aims to compare the consumption of self-generated educational content distributed through short videos on TikTok and podcasts on Spotify, using native metrics of reach and interaction, given that these platforms have transformed how information is accessed and consumed by society. While TikTok and Spotify are primarily associated with entertainment, they also constitute environments with great potential for disseminating educational content to empower digital citizens. Method: A retrospective study was conducted, including 48 short videos on TikTok and 43 podcasts on Spotify. Variables collected: views, likes, comments, shares, total interactions, and engagement rate (ER) for TikTok; and episode duration, streams, plays/downloads, and their normalizations per minute for Spotify. The comparison was performed using non-parametric analysis tests (Kruskal-Wallis-H, Dunn's post hoc test, Spearman's rank correlation coefficient, and Fisher-Freeman-Halton exact test). Results: Both TikTok and Spotify showed heterogeneous performance profiles. The Kruskal-Wallis-H test showed differences between topics in views and interaction rates, with no pairwise differences between topics in TikTok short videos; and identified significant differences in streams, plays/downloads, streams/min, and plays/min in Spotify podcasts. Conclusion: These platforms are complementary; short videos favor exposure to short content and immediate interaction but have less explanatory detail, while podcasts favor sustained attention over longer periods and greater explanatory density, but tend to have less interaction.

Keywords: Educational content dissemination, TikTok, Spotify, Digital citizenship.

1 Introduction

Modern education faces unprecedented challenges, facing a landscape shared with algorithms, attention economies, and digital consumption practices as efficient paths to deliver knowledge, resulting with interest and render comprehension as precarious

measurements [1]. Digital platforms aggregating global audiences enable novel forms of knowledge production and delivery; demanding strategies of cultural translation capable of making knowledge socially inhabitable without sacrificing intellectual rigor [2]. TikTok and Spotify are the major platforms in this modern landscape and demonstrate the conversion of content into measurable units within commercial data ecosystems by hierarchizing visibility and shaping collective practices [3, 4]. Yet, these platforms are mostly associated with leisure and mood regulation [5].

In this modern education landscape, microlearning (organized brief units with thematic coherence and conceptual progression) becomes relevant, and reaches broader audiences when articulated with digital platforms [6, 7]. With this perspective, TikTok has been studied as a context for informal learning and short-form dissemination [8, 9], where views, likes, comments, and shares indicate exposure, interaction, and social reach rather than learning outcomes [10, 11]. Similarly, Spotify fosters discursive continuity and self-organized learning [12-15].

The availability of these platforms demands a critical digital citizenship culture (understanding of recommendation biases, data economies, and mechanisms behind visibility). Therefore, this study aims to analyze and compare the performance of educational content on TikTok and Spotify with reach, interaction, and consumption as key metrics to identify differentiated dissemination patterns which can serve as support, but which on their own do not demonstrate broader strategies for digital citizenship education.

2 Method

The study adopted a quantitative, observational, non-experimental, retrospective, and descriptive-comparative design [16], which included content self-generated by the researchers of this study: 48 short videos on TikTok (organized into 12 tracks with four videos each) and 43 podcast episodes on Spotify (organized into 11 tracks with three or four episodes each) published between September 9 and November 21, 2025. Metrics were extracted on January 27, 2026, from the native analytics panels of each platform.

The variables collected were views, likes, comments, shares, total interactions (sum of likes, comments, and shares), and engagement rate (ER) for TikTok; and episode duration, streams, plays/downloads, and their normalizations per minute for Spotify. Measures of central tendency (medians and interquartile ranges) were used to describe and compare data across tracks and platforms.

The contrast was performed using the Kruskal-Wallis-H test and Dunn's post hoc tests. Spearman's rank correlation coefficient was used to assess temporal and structural associations, and the presence of comments on TikTok was analyzed using a Fisher-Freeman-Halton exact test with Monte Carlo estimation. Statistical significance was set at $p < 0.05$. All analyses were performed using GraphPad Prism.

The educational content disseminated on social media was self-generated and constructed from the following fields of knowledge: exact sciences, biological and health

sciences, social sciences, and arts and humanities. The topics were addressed to promote accessibility to non-specialized audiences without sacrificing conceptual rigor [2, 17].

The above was hosted on the accounts of *Docentes en Acción* (Teachers in Action) (on TikTok: <https://www.tiktok.com/@docentes.en.accio?lang=es-419>; on Spotify: <https://open.spotify.com/show/1bD7Smq2RE9mvK9FmqLAhU>), created and managed by the research group *Práctica y desempeño docente en la educación básica* at the *Centro de Actualización del Magisterio en la Ciudad de México* (CAMCM) (Teacher Training Center in Mexico City).

Because this platform comparison initiative was motivated by a single institutional initiative, the findings offer an analytically delimited comparison of dissemination patterns specific to each platform and therefore do not generalize the results to educational content globally, nor to TikTok or Spotify.

It is important to note that the nature of the variables prevents the use of personally identifiable information, thus granting anonymity to users. Therefore, ethical criteria for privacy regarding identification were maintained. On the other hand, methodologically it was expected not to generate evidence of learning with the self-generated content disseminated on these social networks, because that was not the focus of the object of study.

3 Results

TikTok recorded 19,000 views, 667 profile visits, and 1,202 interactions (912 likes, 35 comments, and 255 shares); while Spotify recorded 362 plays, 549 listens, and 1,136 people reached. Demographically, TikTok and Spotify consumers adults (25-54 years old) with 48.1% and 58.4% women, respectively.

The 48 short-form videos distributed across the 12 thematic series through TikTok yielded heterogeneous performance profiles, reaching an overall median view of 258, a median interaction count of 13, and a median engagement rate (ER) of 0.046.

At the topic level, we observed a differentiated non-linear pattern with a higher reach and interaction around *Healthy Eating and Exercise*, *Chemistry of Love*, and *Mathematical thinking vs Mathematics* topics. *Greenhouse effect/Climate Change* reached the widest distribution. *Renewable energies* achieved the highest engagement rate despite a modest view count. *Scientific method and Chemistry in cosmetics* showed the weakest communicative performance in absolute terms, while the remaining series occupied the intermediate positions.

The Kruskal-Wallis-H test showed between topic differences in views and engagement rates with no topic pairwise difference, suggesting a global rather than localized effect. The week vs. engagement rate showed a moderate negative association, suggesting progressive erosion of proportional audience over the publication period. Eighteen of the 48 videos registered at least one comment, indicating a low but non-trivial rate of explicit dialogic participation (Table 1).

Table 1. TikTok: summary of statistical tests.

Block	Variable	Test	Statistic	df	p	n
Comparison	Views	Kruskal-Wallis	H=21.14	11	.032	48
Comparison	Engage- ment rate	Kruskal-Wallis	H=20.28	11	.0416	48
Temporal	Week vs. views	Spearman	$\rho=.054$	—	.7142	48
Temporal	Week vs. ER	Spearman	$\rho=-.528$	—	.0001	48
Conversation	Comments by topic	Fisher-Free- man-Halton, Monte Carlo	—	—	—	48

Similarly, the 43 podcast episodes distributed across the 11 thematic series through Spotify showed heterogeneous consumption profiles. The median episode duration was 664.2 seconds, with a median stream of 10, median plays/download count of 6, median streams-per-minute rate of 0.7277, and a median plays-per-minute rate of 0.5198. At the topic level, we observed a clear distinction between absolute consumption and duration-adjusted efficiency, with *Invisible Disability* and *Chemistry of Love* showing the higher consumption (although the longer duration of the latter reduced its per-minute performance), *Mathematical thinking* and *Oder of operations* achieved the most efficient per-minute profiles; *Biodiversity* and *Schools in inequality* showed the lowest absolute consumption; *Self Care* and *Teacher training* illustrate longer episodes maintaining moderate absolute listening while reduced normalized indicators. Here, the Kruskal-Wallis-H test identified significant between-topic differences in streams, plays/downloads, streams/min, and plays/min. Week of publication was negatively associated with all metrics; duration was not significantly related to absolute metrics but was to per-minute normalizations (Table 2).

Table 2. Spotify: summary of statistical tests.

Block	Variable	Test	Statistic	df	p	n
Comparison	Streams	Kruskal-Wallis	H=35.15	10	.0001	43
Comparison	Plays/downloads	Kruskal-Wallis	H=35.82	10	<.0001	43
Comparison	Streams/m	Kruskal-Wallis	H=32.39	10	.0003	43
Comparison	Plays/min	Kruskal-Wallis	H=33.44	10	.0002	43
Temporal	Week vs. streams	Spearman	$\rho=-.7156$	—	<.0001	43
Temporal	Week vs. plays	Spearman	$\rho=-.7379$	—	<.0001	43
Temporal	Week vs. streams/m	Spearman	$\rho=-.3434$	—	.0242	43
Temporal	Week vs. plays/m	Spearman	$\rho=-.5635$	—	<.0001	43
Structural	Duration vs. streams	Spearman	$\rho=.2432$	—	.116	43
Structural	Duration vs. plays	Spearman	$\rho=.2511$	—	.1043	43
Structural	Duration vs. streams/m	Spearman	$\rho=-.5708$	—	<.0001	43
Structural	Duration vs. plays/m	Spearman	$\rho=-.3315$	—	.0299	43

4 Discussion

This study analyzed and compared the performance of educational content on TikTok and Spotify using reach, engagement, and consumption as key metrics to identify distinct dissemination patterns. Heterogeneous performance profiles were observed on both platforms, with TikTok serving as a platform for rapid exposure and algorithmic amplification of information (favoring immediate visibility), while Spotify was seen as a platform for sustained attention consumption. This suggests two complementary communicative ecologies; from a classical sociological perspective, this divergence can be interpreted as a rationalization of attention in the modern digital educational sphere, demonstrating the organization of collective practices that stabilize forms of social interaction [18]. At the same time, it resonates with contemporary critiques of the performance economy and the capture of subjective time [1], as well as with the ideological mediation of informational environments [19, 20].

The metrics for both platforms point to a broad and episodic form of dissemination, consistent with recent evidence on microlearning in social media environments. In these spaces, short videos maximize interaction, traffic, and immediate user recognition, while audio sustains continuity, habit formation, and narrative density, even with a lower absolute volume of users [6, 9]. Because views, listens, and reach do not measure the same phenomenon, their comparison should be read as a contrast of affordances. Therefore, our results suggest that these digital platforms enable different configurations for educational dissemination: TikTok opens attention while Spotify retains it in favor of argumentative articulation, a pattern consistent with comparative analyses of engagement and platform-dependent communicative performance [21].

The interactions on TikTok (likes, comments, and shares) correspond to distinct practices of rapid affective evaluation, public deliberation, and reach amplification. Shares function as a proxy for social recommendation and transfer of content, bridging the content beyond the original audience and signaling social legitimacy, while comments open a potential for dialogue. Such behavior is embedded in the attention economy, lying not only in the content itself but in how it is framed to circulate within saturated media environments [22]. Under this perspective, it is relevant to prevent confusing visibility with cognitive appropriation; although the microformat promotes access and curiosity, it also promotes fragmented consumption. Therefore, we recognize engagement as an entry signal, where evidence of learning, comprehension, or attitudinal change is still to be measured and demonstrated.

In contrast, Spotify's metrics should be read through the logic of sustained time [12], where listens and plays reflect an encounter that requires intentional listening and deliberate consumption. This pattern is understandable and compatible with the potential it would have in school contexts (with podcasts), including reflective support and stimulation of deep and collective thinking [11, 13]; although it is emphasized that this research did not focus on measuring the impact of learning through content disseminated on social networks. Research on educational podcasts shows that listening motivations (perceived usefulness, thematic interest, and media habit) are associated with intentions of continuity and recommendation. From an interpretative point of view regarding the

relevance of content dissemination for digital citizenship, Spotify complements TikTok by turning initial curiosity into a more narratively dense experience [12, 13, 23].

The findings are best discussed within the framework of platform-mediated microlearning, where the design of minimal units (micro-videos) serves as an anchor, while semantic coherence and seriality function as a progression mechanism. This integration has the potential to broaden reach and engagement, while effectiveness depends on instructional design and the congruence between objective, format, and consumption context [6, 7]. TikTok operates as a dissemination system governed by retention and response signals, where thematic performance is interpreted as an indicator of social interest and audiovisual readability tailored to the platform's language [9]. Similarly, Spotify functions as a channel for consistent microlearning, where content designed with argumentative structure, rhythm, duration, and thematic promise is reproduced with weekly consistency, functioning as a cultural habit [13].

Framing this study within a digital citizenship education perspective, TikTok and Spotify work more than distribution channels when educational designs explicitly incorporate platform literacy, recognizing that learning with platforms also implies learning about them. Integrative reviews of algorithmic literacy and algorithm-mediated use highlight that people coexist with automated recommendations without fully understanding their logics [24, 25]. Educational projects using social media gain depth when they incorporate metacognitive pauses that encourage users to ask: Why did I see this? What made it visible? What data does my interaction produce? These micro-questions build a bridge toward the philosophical dimension of ideology in the digital environment and the colonization of information in cyberspace [20], alongside the critique of transparency as a form of control [1]. Visibility is not neutral, but a sociotechnical construction preconfigured by recent patterns of use and recommendation logics that normalize certain meanings. Although this study does not evaluate a formal pedagogical intervention, producing educational dissemination on platforms means negotiating with commercial systems of attention, making the discussion more consistent when it explicitly recognizes that the medium is not neutral; it structures the message, the rhythms, and the conditions of visibility.

A neuropsychological reading justifies interpretive caution: recent evidence associates short-video use in certain profiles with attentional difficulty, disruption of working memory, and cognitive fatigue, linking reinforcement mechanisms with patterns of repetitive consumption [26]. This evidence underscores the importance of pacing, thematic deepening, and articulation with longer formats that allow consolidation beyond the cognitive window typical of vertical-feed scrolling.

The inherent limitations of the study include reliance on private platform metrics, the absence of direct learning measurements, a structure limited to a single initiative, and the potential influence of uncontrolled factors (posting schedules, algorithms, distribution networks, visual design). Future research should combine platform analytics with surveys or focus groups to estimate content comprehension and appropriation. Quasi-experimental designs comparing TikTok-Spotify routes versus single-platform strategies would also be valuable, as would the incorporation of algorithmic literacy indicators that connect educational outreach to a broader critical digital citizenship agenda [25, 27].

5 Conclusions

Digital platforms like TikTok and Spotify are complementary: short-form videos favor rapid exposure, immediate interaction, and social amplification to activate curiosity, while podcasts foster sustained listening, discursive continuity, and greater explanatory density, delivering ideas in depth and avoiding the false dichotomy between entertainment and education [1, 20]. Native analytics enable the characterization of communicative performance in real digital environments but do not measure learning or knowledge transfer. Educational dissemination on digital platforms, therefore, demands intentional design, conceptual grounding, and critical appraisal of the data each algorithmic architecture generates.

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References

1. Han, B.-C.: *The Burnout Society*. Stanford University Press, Stanford (2015).
2. Burns, T.W., O'Connor, D.J., Stocklmayer, S.M.: Science communication: A contemporary definition. *Public Underst. Sci.* 12(2), 183–202 (2003). <https://doi.org/10.1177/09636625030122004>
3. Nieborg, D.B., Poell, T.: The platformization of cultural production: Theorizing the contingent cultural commodity. *New Media Soc.* 20(11), 4275–4292 (2018). <https://doi.org/10.1177/1461444818769694>
4. Williamson, B.: Big EdTech. *Learn. Media Technol.* 47(2), 157–162 (2022). <https://doi.org/10.1080/17439884.2022.2063888>
5. Jung, Y., Kim, T., Lee, S., Min, S., Sung, Y.: Short Made Them Powerful: Exploring motivations and problematic uses of TikTok. *Cyberpsychol. Behav. Soc. Netw.* 28(2), 90–97 (2025). <https://doi.org/10.1089/cyber.2024.0328>
6. Denojean-Mairet, M., Lopez-Pernas, S., Agbo, F.J., Tedre, M.: A literature review on the integration of microlearning and social media. *Smart Learn. Environ.* 11, 46 (2024). <https://doi.org/10.1186/s40561-024-00334-5>
7. Monib, W.K., Qazi, A., Apong, R.A.: Microlearning beyond boundaries: A systematic review and a novel framework for improving learning outcomes. *Heliyon* 11(2), e41413 (2025). <https://doi.org/10.1016/j.heliyon.2024.e41413>
8. Carpenter, J.P., Morrison, S.A., Shelton, C.C., Clark, N., Patel, S., Toma-Harrold, D.: How and why educators use TikTok: Come for the fun, stay for the learning? *Teach. Teach. Educ.* 142, 104530 (2024). <https://doi.org/10.1016/j.tate.2024.104530>
9. Conde-Caballero, D., et al.: Microlearning through TikTok in higher education: An evaluation of uses and potentials. *Educ. Inf. Technol.* 29(2), 2365–2385 (2024). <https://doi.org/10.1007/s10639-023-11904-4>

10. Tenenboim, O.: Comments, shares, or likes: What makes news posts engaging in different ways. *Soc. Media Soc.* 8(4) (2022). <https://doi.org/10.1177/20563051221130282>
11. Gunderson, J.L., Cumming, T.: Podcasting in higher education as a component of Universal Design for Learning: A systematic review. *Innov. Educ. Teach. Int.* 60(4), 591–601 (2023). <https://doi.org/10.1080/14703297.2022.2075430>
12. McNamara, S.W.T., Wittmann, M.A., Schoenborn, C.A., Taylor, J.: Understanding why educational professionals engage with podcasts: Scale development and validation. *Br. J. Educ. Technol.* 55(4), 1728–1746 (2024). <https://doi.org/10.1111/bjet.13428>
13. Thomas, M.A.M., et al.: Podcasts as pedagogy in higher education: A scoping review. *Br. J. Educ. Technol.* (2025). <https://doi.org/10.1111/bjet.70021>
14. Choi, M.: A concept analysis of digital citizenship for democratic citizenship education in the internet age. *Theory Res. Soc. Educ.* 44(4), 565–607 (2016). <https://doi.org/10.1080/00933104.2016.1210549>
15. UNESCO: Global Citizenship Education: Topics and Learning Objectives. UNESCO, Paris (2015).
16. Creswell, J.W., Creswell, J.D.: *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, 5th edn. SAGE, Thousand Oaks (2018).
17. Deguchi, A., et al.: What is Society 5.0? In: *Society 5.0: A People-Centric Super-Smart Society*, pp. 1–23. Springer, Singapore (2020). https://doi.org/10.1007/978-981-15-2989-4_1
18. Durkheim, E.: *The Rules of Sociological Method*. The Free Press, New York (1982).
19. Chomsky, N., Herman, E.S.: *Manufacturing Consent: The Political Economy of the Mass Media*. Pantheon Books, New York (1988).
20. Žižek, S.: *Living in the End Times*. Verso, London (2011).
21. Sörensen, I., Vogler, D., Fürst, S., Schäfer, M.S.: Platforms matter: analyzing user engagement with social media content of Swiss higher education institutions. *J. Mark. High. Educ.* 36(1), 149–168 (2026). <https://doi.org/10.1080/08841241.2023.2289009>
22. Kubler, K.: Influencers and the attention economy: the meaning and management of attention on Instagram. *J. Mark. Manag.* 39(11–12), 965–981 (2023). <https://doi.org/10.1080/0267257X.2022.2157864>
23. Estelles, M., Doyle, A.: From safeguarding to critical digital citizenship? A systematic review. *Rev. Educ.* 13(1), e70056 (2025). <https://doi.org/10.1002/rev3.70056>
24. Gagrcin, E., Naab, T.K., Grub, M.F.: Algorithmic media use and algorithm literacy: An integrative literature review. *New Media Soc.* 28(1), 423–447 (2026). <https://doi.org/10.1177/14614448241291137>
25. Petrovic, A., Reisdorf, B.C., Vehovar, V., Bartol, J.: Disentangling the role of algorithm awareness and knowledge in digital inequalities. *Inf. Commun. Soc.* 28(4), 557–574 (2025). <https://doi.org/10.1080/1369118X.2024.2363896>
26. Alruwaili, R.F.: Scroll immersion and short-form video use: Predictors of attention, memory, and fatigue among Saudi social media users. *Acta Psychol.* 260, 105674 (2025). <https://doi.org/10.1016/j.actpsy.2025.105674>
27. Pangrazio, L., Selwyn, N., Cumbo, B.: Tracking technology: Exploring student experiences of school datafication. *Camb. J. Educ.* 53(6), 847–862 (2023). <https://doi.org/10.1080/0305764X.2023.2215194>

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