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Digital Platforms and Big-Tech in Public Schools: Why Are Families and Students Concerned?

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The current process of digitisation of education is marked by the presence of digital platforms of large technology corporations or Big Tech in a growing number of schools. This process of platformisation is generating multiple challenges for the Public Administration and for global education systems. In this process of platformisation, this research explored and analysed the perceptions of parents and students regarding the use of digital platforms in public schools. A mixed methodological design was used for this purpose. In the quantitative part, data was collected from 2,330 Catalan families (Spain) with children studying in public primary or secondary schools. In the qualitative part, eight focus groups were carried out with students from six schools. The results showed that the main concerns of students and families revolve around three main issues: 1) the management of the data that companies can collect from the use of their digital platforms, 2) the educational aspects related to the use of digital platforms at school and, 3) the potential costs associated with the use of these platforms. The paper concludes that there is a need for greater involvement of the Public Administration in ensuring safer use of these digital resources in schools.

Keywords: digital platforms in education, platformisation, use of data, concerns, Catalonia, education, public school

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INTRODUCTION

Literature Review

Since the outbreak of the COVID-19 pandemic, the process of digitisation of education has accelerated on an international scale (Barbour et al., 2020). This has led to the increasing presence of digital platforms provided by large technology or Big Tech corporations (including Google, Apple, Meta, Amazon and Microsoft) in public education systems to address the challenges inherent to confinement and the need to implement large-scale remote learning (Ozalp et al., 2022; Jacovkis et al., 2022; Rivera-Vargas & Jacovkis, 2022; Williamson & Hogan, 2020). In this context, education has become a very lucrative sector for transnational corporations (Norris, 2022; Verger et al., 2017). Thus, it is no wonder that these global corporations are trying to expand their business in the techno-educational market with the aim of increasing their profits and influence over education (Teräs et al., 2020; Williamson et al., 2022).

Currently, socialisation processes are developed in the context of a digital society governed by the logics of datafication inherent in the use of digital platforms in our everyday life, as well as in the different social environments we share (Poell et al., 2022; Jacovkis et al., 2022). Digital platforms developed by Big Tech (such as Google Classroom and Microsoft Teams) have been widely implemented in school systems in both the Global North and the Global South (Selwyn, 2022). As a result, transnational corporations are gaining influence in the public management of education (Williamson, 2021), but also in the processes of socialisation and teaching that take place virtually in the school context (Kerssens & Van Dijck, 2022). Poell et al (2019) provide a definition of digital platforms that describes their evolution and social consolidation very well. According to these authors, digital platforms can be defined "as (re-)programmable digital infrastructures that facilitate and shape personalised interactions between end-users and complementors, organised through the systematic collection, algorithmic processing, monetisation and circulation of data" (p. 3).

The process of platformisation has also led to the emergence of certain insecurities and fears linked to the uses that technological corporations make of data, especially in the educational sphere. Despite the perceived benefits associated with the use of digital platforms, concerns are emerging in school communities about the distractions they can cause during the teaching-learning process (Sancho et al., 2020), as well as possible infringements of students' rights and privacy, and the emergence of new social inequalities caused by unequal access to technologies and/or the type of content they reproduce (Stoilova et al., 2020; van Dijck, 2020).

Situated in the educational context, the introduction of digital platforms in public schools entails the datafication of school life. Such platforms enable the collection, systematisation, management, and monitoring of large-scale data on both teachers and students. Thus, it is not by chance that new concerns emerge regarding the uses of this data by transnational technology corporations. Recent research (Osorio-Saez et al., 2021a, 2021b; Treviño et al., 2021) has investigated parental involvement in the uses of digital technologies for educational purposes during the global pandemic. For example,

Osorio et al. (2021b) note that the structure of digital platforms and tools and parents' perception of their capabilities in using such technologies influence their engagement in supporting children's learning. On the other hand, Treviño et al. (2021) point out the crucial role of parents' socioeconomic status in explaining the formal and informal practices developed to support their children's learning during the COVID-19 pandemic.

Catalonia is an autonomous community within the Spanish state, but it holds educational competencies, allowing it to design important part of its own curriculum. The case of Catalonia is particularly relevant since, for more than a decade, the products from transnational technological corporations (or Big Tech) have been used in the public education system (Gros et al. 2020). Specifically, around 2010, Google facilitated the use of Google Apps to the Catalan Department of Education (Ambròs Pallarès & Ramos Sabaté, 2017). Among other aspects, this cession facilitated access to various services of the company, including the Suite that Google has developed for schools (currently known as Google for Education) and the Google email environment, customized for the Catalan Department of Education, granting it greater storage capacity (Generalitat de Catalunya, 2010).

From this point onwards, the Department of Education managed the email accounts of administrative and teaching staff through Google and, despite limited financial and technical resources, it also promoted the creation of email accounts for all secondary school students (Ambròs Pallarès & Ramos Sabaté, 2017). In recent years, the presence of Big Tech companies in the Catalan Public Administration has become naturalized and consolidated, although some critical voices from civil society organizations (such as Xnet) have emerged. It was in this context that the edDIT project arose, the main objective of which was to determine the impact of the use of corporate digital platforms in public schools on children's rights. Specifically, for this article, the perceptions of parents and students on the use of digital platforms in public schools in Catalonia have been considered. Thus, the objective of this research is to examine the opinions and, in particular, the concerns of parents and students regarding the use of digital platforms for educational purposes in schools.

Therefore, the following question has guided the development of this work: what are the opinions and in particular the concerns of parents and students regarding the use of digital platforms for educational purposes in schools? To answer this question, we combined data from surveys of parents and legal guardians of children and young people attending public primary and secondary schools in Catalonia with eight focus groups of students enrolled in schools with similar characteristics.

METHOD

This article is the result of a larger project based on a mixed design (Cohen et al., 2018) that combined, on the one hand, the collection of data through the implementation of a questionnaire on the perceptions of families in Catalonia regarding the use of commercial digital platforms in schools, and on the other hand, the information provided by eight focus groups with primary and secondary school students from public schools in Catalonia.

In the quantitative study, the self-report instrument "Questionnaire on perceptions in families" (Calderón-Garrido et al,. 2022) was administered. The structure of the questionnaire consisted of five socio-demographic questions, and eight statements with which the informants showed their degree of disagreement or agreement through a six-level Likert scale (1 = Strongly Disagree and 6 = Strongly Agree). The choice of these statements was based on a review of the scientific literature on the subject. The instrument was administered virtually during the months of May and June 2022. This questionnaire was subjected to a process of analysis of its reliability and validity (construct, convergent and discriminant) through psychometric analysis (Moreno-González et al., 2023). The r and rstudio software were used to count and statistically analyze the results. The responses analyzed showed good reliability ($\alpha = .88$).

The sample was accessed through social media, without making any distinction. The instrument was administered to 2,909 people. A screening based on the acceptance of the informed consent and on the adequacy of the inclusion criteria (having a child or guardian studying primary or secondary education in a public school) resulted in a final sample of 2,330 participants. This is adjusted to a representative sample of the population with respect to the universe (566.555 families in Catalonia) with a margin of error of less than 2% and a confidence interval of 95%. 82.1% of the informants were female. The mean age was 44.14 years (SD = 5.35). Regarding the highest level of studies completed, 35.4% had completed pre-university studies, 47.0% had completed university studies and 17.6% had completed Postgraduate, Master's or Doctoral studies. Regarding the student for which they responded, in the case of having more than one child who met the inclusion criteria, they were asked to base their answers on the eldest child. 51.9% of the students were male and their mean age was 10.62 years (SD = 2.79).

In the qualitative study, we adopted an interpretative approach that enabled us to construct the students' discourses around certain thematic axes, allowing for the comparison and contrast of their perspectives with those of the families through focus groups (Stewart, 2018). To this end, eight focus groups were conducted with students from six schools (2 primary schools, 2 secondary schools and 2 comprehensive schools) characterized by their heterogeneity in terms of geographical location, social composition and digital platform used (2 schools of maximum social complexity and 4 of low social complexity) (Table 1). The number of groups was determined by the availability of these in the six selected educational institutions, as they represented the maximum possible heterogeneity. Two different dynamics were used to develop the focus groups. The first was aimed at identifying the uses of digital platforms, as well as the educational experience linked to them. The second aimed to gain a deeper understanding of students' perceptions of the safe use of online devices (both in and out of school) and digital platforms.

Table 1
Participants in student focus groups

Identifier	Social characteristics	No. of focus groups	Focus group participants
Centre 1	Maximum social complexity	1	6 pupils in 6th grade of primary school, 3 girls and 3 boys.
Centre 2	Maximum social complexity	2	Group 1: 6 pupils in 6th grade of primary school, 3 girls and 3 boys. Group 2: 6 pupils in 2nd and 4th year of secondary school, 3 girls and 3 boys.
Centre 3	Maximum social complexity	1	5 pupils in 3rd and 4th year of secondary school, 2 girls and 3 boys.
Centre 4	Low social complexity	1	6 pupils in 6th grade of primary school, 3 girls and 3 boys.
Centre 5	Low social complexity	1	10 students in the 4th year of secondary school, 9 girls and 1 boy.
Centre 6	Low social complexity	2	Group 1: 9 pupils in 5th and 6th grade of primary school, 4 girls and 5 boys. Group 2: 8 students in 3rd and 4th year of secondary school, 4 girls and 4 boys.

The focus groups with students consisted of a minimum of 5 and a maximum of 10 participants in each case, who were selected based on a criterion of heterogeneity in their social profile. The sessions lasted between 50 and 90 minutes and were transcribed verbatim and coded using ATLAS.ti software. We worked with the evidence based on discourse analysis by grouping and categorizing the participants' responses. This type of analysis was selected from Wetherell and Potter (1998) because it posits discourse as a social practice, and not just as a set of utterances.

In the phase of coding and processing of the qualitative information, the transcripts were grouped according to the type of school (primary or secondary). The coding process was then developed based on the interview guidelines. Subsequently, the units of meaning created in each type of school were grouped into a single framework of group narratives. This work reduced the volume of data, highlighting those collective narratives directly and indirectly linked to the research objectives. By systematically reading the codes, the selected statements, and their context, we then looked for patterns, themes, and regularities, as well as contrasts, paradoxes, and irregularities (Denzin & Giardina, 2016). The codes were then linked, grouped, and regrouped until they made sense to create consolidated learner discourses. To facilitate reading and argumentation of this paper, these discourses were finally organized following the three categories of concerns that resulted from the cluster analysis of the families' responses:

- Use of data from digital platforms (Use and commercialization, Infringements of privacy, Determine the preferences and Profiling)

- Educational issues (Source of distraction, Reduce face-to-face socialization and Insufficient supervision from the school)

- Economic aspects (Pay for services).

Finally, in the last phase, a triangulation and analytical discussion was carried out using both the qualitative and quantitative information obtained. The coherence and correlation between both types of information was analysed, identifying the most significant similarities and differences between the families' perceptions and the students' discourses.

FINDINGS

The results of the analysis are presented by combining the evidence provided by the family questionnaire and the students' discourses derived from the focus groups. First, the distribution of the families' responses allowed us to identify three groups of variables. These, in turn, provided the categories examined in the focus groups. The qualitative evidence is then presented, with reference to the relevant quantitative associations between variables. It is worth noting that, as will be demonstrated, while some significant gender differences emerge from the quantitative data, these differences are not visible in the qualitative evidence.

Regarding the opinion of families in relation to the use of commercial digital platforms (such as Google Classroom and Microsoft Teams) in schools, the results showed high scores on all items on the scale ([1] Use and commercialisation, $M = 4.84$, $SD = 1.51$; [2] Pay for service, $M = 4.15$, $SD = 1.70$; [3] Violations of privacy, $M = 4.82$, $SD = 1.54$; [4] Determine the preferences, $M = 4.53$, $SD = 1.57$; [5] Profiling, $M = 4.32$, $SD = 1.73$; [6] Source of distraction, $M = 3.97$, $SD = 1.62$; [7] Reduce face-to-face socialisation, $M = 4.63$, $SD = 1.53$; [8] Insufficient supervision from the school, $M = 4.52$, $SD = 1.46$). A positive correlation between all items was recorded ($p < .001$ in all cases). This tells us that all the variables are related, so that all the concerns raised are dependent on each other. Thus, the concerns are common in all cases. Figure 1 shows the distribution of the responses in each item, as well as the correlations between the different items.

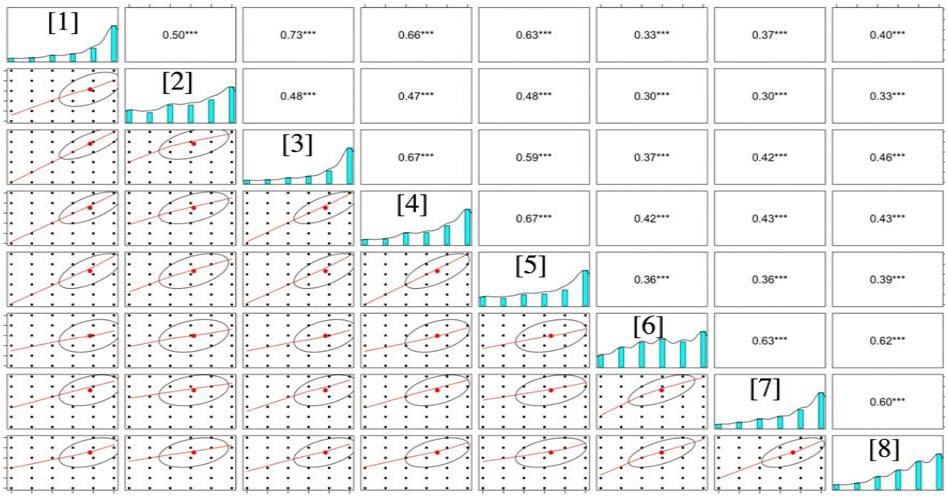

Figure 1
Distributions of the responses for each item, and with correlations

A cluster analysis of the results showed how the variables were distributed in three groups. The first one related to the use of data from digital platforms (Use and commercialization, Violations of privacy, Determine the preferences and Profiling); the second one to educational issues (Source of distraction, Reduce face-to-face socialisation and Insufficient supervision from the school), and the third one to economic aspects (Pay for services). Figure 2 shows the dendrogram.

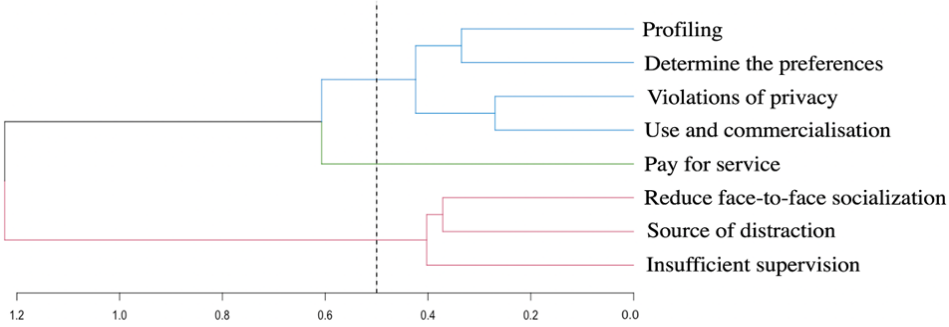

Figure 2
Dendogram of the variable cluster

Regarding this division, no statistical differences were reported according to gender in the case of concerns related to the use of data or economic aspects, However, they were detected in all items related to educational aspects. Female respondents scored higher in all of these items.

The voices of the children and young people contribute to a better understanding and the problematisation of both the use of data from digital platforms and the educational issues related to the use of these platforms at school and at home. Economic aspects are also highlighted by some of their discourses but, as we will show, their concerns are not focused on the future costs of digital services.

In accordance with the families' responses, the use of data from digital platforms is the more salient concern for the students (Table 2). Privacy and commercialisation stand out over the rest of the issues they stress. In this regard, both primary and secondary education students share feelings of surveillance by the digital platforms, especially when they use them at home. This surveillance is expressed in terms of "being heard" (Centre 3) and "tracked" (Centre 4). Interestingly, they tend to consider that, when it comes to the digital platforms used by their schools, the control and supervision provided by their teachers is higher than that of their families. This control is in some cases also understood as surveillance (by the school, and not by the platforms) and represents a tension between their feelings of a lack of freedom in their use of the platforms and their recognition of the necessary protection that schools provide them when surfing the Web. As mentioned in a focus group with primary education students:

> *I feel free at home. My mother doesn't control me as much [as they do at school]. [At the school we feel protected] because if you access to some page and you can't go out, the teacher can help you (Centre 1).*

This is connected with the greater concern they pose when referring to non-educational digital platforms, mostly used at home, in comparison to digital platforms used in education, used both at school and at home. In contrast to what the families' responses show (Table 2), practices of profiling and shaping preferences barely appeared among the students' concerns.

Table 2
Gender means and statistical differences in the use of data from digital platforms

Variable	Male		Female		Statistical differences
	M	*SD*	*M*	*SD*	
Use and commercialisation	4.90	1.533	4.83	1.504	t_{2328} = .859; p = .198
Profiling	4.31	1.752	4.32	1.727	t_{2328} = -.114; p = .455
Violations of privacy	4.79	1.608	4.83	1.518	t_{2328} = -.448; p = .327
Determine the preferences	4.50	1.538	4.53	1.578	t_{2328} = -.401; p = .344

The following statement by a group of secondary education students highlights the connection between their concerns and the schools' strategies to raise their awareness on issues like mental health, but not on profiling.

> *I think these talks on network security [we receive at school] and so on, only focus on the issue of photos on Instagram... If they are retouched and then this affects our mental health, but they don't tell us anything about Google monitoring everything. I think that's important (Centre 3).*

In relation to educational issues, the reduction of face-to-face socialisation does not seem to raise as much concern among students as among families. Indeed, students do not address this issue in general, but rather point to "individual" risks of the massive use of digital platforms at school, which they say, "could contribute to the development of addictions and other abusive behavior outside of school" (Centre 6).

As already mentioned, according to the students' discourses, supervision by schools, which is a critical issue according to the families' responses (Table 3), is framed more as a data use issue than as an educational one. However, when it appears as an educational issue, students tend to consider that some teachers know less than them about digital platforms, and that they teach their parents more than the other way around. The following quotation illustrates this perception by students:

> *Q: They have taught you how to use the Drive?*
>
> *A: I think we are the ones who help them. They know less than we do (Centre 6).*

The concerns of families about this issue are therefore far removed from those of the students, who tend to connect supervision to control or surveillance rather than education or training. In terms of gender, females scored higher on all items, showing statistical differences compared to males.

Table 3
The number of students attending culture courses

Variable	Male		Female		Statistical differences
	M	*SD*	*M*	*SD*	
Source of distraction	3.70	1.587	4.02	1.622	t_{2328} = -3.697; p < .001
Reduce face-to-face socialisation	4.40	1.591	4.67	1.512	t_{2328} = -3.368; p < .001
Insufficient supervision from the school	4.33	1.479	4.57	1.453	t_{2328} = -3.502; p < .001

The potential of distraction that digital platforms can represent is recognised by both families and students. However, while this distraction is read as a negative consequence of the use of digital platforms by families (Table 3), students interpret this valuation in a more balanced way. As the data show, some of them seem to feel more stressed when using digital platforms at school than at home, where they can stop for a while and do something else. At home, they resolve any doubts they may have in relation to their educational activities by using external resources, which are vetoed in some schools (search engines, videos, etc.). Therefore, the distraction is more experienced as an ability to use different resources even to complete school tasks than as an undesired effect of the use of digital platforms (Centre 3). In addition, as the following statement shows, some students see digital platforms as a way out of their boredom:

> *When I get bored and I'm not doing what I should be doing (...) I literally open a window, open a tab, and start looking for things. Sometimes it has nothing to do with the topic, but still...anything to distract me (Centre 2).*

In relation to the third group of variables, students made no reference to fears of future charges for the use of digital platforms. However, pointing again to the relationship between freedom of use and protection and control by the schools, they complain about the limitations of using their digital devices according to their schools' norms. As far as their devices are paid by their families, they consider they should be able to exploit their full potential usage, and not be limited by barriers to accessing content and applications decided by their schools (Centre 5). Table 4 shows the means and standard deviations, as well as the Student's t-test values for gender differentiation.

Table 4
Means and statistical differences in educational issues

Variable	Male		Female		Statistical differences
	M	*SD*	*M*	*SD*	
Pay for services	4.06	1.742	4.17	1.688	t_{2328} = -1.260; p = .104

In no case were statistical differences reported according to the gender of the students ($p > .05$ in all cases), but some differences appeared, mostly related to educational issues, according to the gender of the respondents. In these cases, females were more concerned than males.

Finally, the age of the students did not affect the concerns expressed by the families ($p < .05$ in all cases). A weak negative correlation ($0 > r > -.01$) was detected between the age of the informant and the items related to the concern in the use of data. This was not the case for items related to educational or economic concerns. In the case of students, economic concerns were visible among those in secondary education. For them, digital

devices are selected and configured by the school but normally have to be bought by their families. Regarding their concerns on the use of data and on educational issues, few differences are perceived between primary and secondary students. However, those in secondary education highlight more the tension between their freedom to use digital technology and the control by their schools.

DISCUSSION AND CONCLUSIONS

All the results presented in this article on the concerns of families and students confirm and deepen to some extent aspects already pointed out by previous research (see Prendes-Espinosa et al., 2020; Perrota, 2022). For example, the introduction of digital platforms in public education systems, on the one hand, increases the process of phantomization of social and family life (Osorio-Saez et al., 2021a, 2021b; Poell et al., 2022; Treviño et al., 2021), broadens the spheres of influence of technology corporations in education (Kerssens & van Dijck, 2022; Williamson, 2019) and, at the same time, enables the generation of connections between school practices and students' lives and backgrounds outside of schools (Erstad et al., 2021). All these facts generate insecurities and uncertainties that, in general, arouse more concern among families than among students.

Students are especially vulnerable in terms of exposure of their private lives and control over their privacy. Therefore, the results of this research point to the need of working towards their acquisition of greater awareness about the risks associated with the social and pedagogical use of digital platforms. In addition, as Calderón-Garrido et al. (2024) already pointed out, the concerns of families highlight the need to generate greater critical awareness among them.

Returning to the initial question posed in the introduction: what are the opinions and the concerns of parents and students regarding the use of digital platforms for educational purposes in schools? We highlight some considerations according to each of the analysed dimensions.

In line with Hodges et al. (2020) and Saura et al. (2022), the interesting exploitation by Big Tech of data generated using digital platforms is, according to our results, the concern most highlighted by both families and students. For the two actors, both the right to privacy and the potential commercialisation of data are affected.

In relation to the perception of surveillance, primary and secondary school students recognize that they feel monitored by the Big Techs when using their digital platforms outside of school. When using them at school, they consider that the control and supervision exercised by their teachers is greater than that by their families. On the other hand, according to the families' opinions, there is insufficient supervision by the school regarding the safe use of digital platforms. This contradiction between students' and families' perceptions also ratifies the preliminary findings of Stoilova et al. (2020) and points to the need to habilitate common spaces of reflection for schools, families, and students. These spaces would contribute to a construction of a shared understanding of the exposure that the use of digital platforms could represent for them. It could also improve the identification of strategies of protection that the different actors can adopt,

depending on their role in the process, that go from the very selection of the digital platform for the school to the ways of regulating the use of digital platforms at home.

In relation to digital competence and usability of digital media, the monitoring by schools, which is a relevant issue according to the families' responses, is framed more as an issue of data use than as an educational issue. However, when considered an educational issue, the students feel that teachers and families know less about digital platforms than they do, and that they teach them more than the other way around. At this point, it is important to emphasize the need of promoting critical digital literacy among all the actors, and particularly among students. Otherwise, their confidence in their instrumental digital skills could provide them with a misadjusted image of their digital competence. This could lead students to a false sense of security while using digital platforms and being in the digital environment.

Another relevant aspect is the distraction that could be caused using digital platforms at school, which is recognized both by families and students. Interestingly, however, while this distraction is read as a negative consequence of the use of digital platforms by families, students seem to feel more stressed when using them at school than at home, where they can stop for a while and do something else. At home, they can solve different doubts they have in relation to their educational activities by using external resources, which are forbidden in some schools (search engines, videos, etc.). Therefore, in line with Rivera-Vargas & Cobo (2020), distraction is experienced more as an ability to use different resources -even to complete school tasks- than as an undesired effect of the use of digital platforms.

This research points to multiple challenges linked to the expansion of the global education industry and the use of commercial digital platforms in public schooling. Through platform-based large-scale digital data mining, Big Techs have gained great power to monitor, evaluate and shape human, political and economic behavior in society (Yeung, 2018). In this context, in the face of the rapid platformisation of education, there is a need to clarify who is responsible for the control and use of students' digital data generated through such platforms. Moreover, to ensure that the use of digital platforms at school responds to educational purposes, it would be necessary to deepen pedagogical and family reflection on the use of these platforms and on their potential effects on teachers' work and students' learning experiences.

IMPLICATIONS AND RECOMMENDATIONS

The results of this research highlight the main concerns of students and families regarding the use of Big Tech platforms in public educational institutions. Therefore, these results should be considered when designing public policies and regulations to safeguard privacy and data protection within the Catalan educational system. We deem it necessary to further explore the analytical dimensions addressed in this study through additional research focused on other territorial contexts, which would allow for comparative analyses. Moreover, it is essential to incorporate the perspectives of teachers and public administration into such research. Ultimately, this study would also provide evidence on the management and use of data stored on digital platforms, thereby supporting the promotion of transparency and digital sovereignty.

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