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## **Abstract**

### **Purpose**

The purpose of our paper is to examine how higher education students think about educational technologies they have previously used—and the implications of this understanding for their awareness of datafication and privacy issues in a post-secondary context.

### **Design/Methodology/Approach**

We conducted two surveys about students' experience with the ClassDojo platform during their secondary education. In both surveys, we included a question asking students to identify which ClassDojo-like platform they used in school. For this study, we examined responses to these screening questions, identifying the technologies that responses referred to and sorting technologies into categories.

### **Findings**

Students identified a wide range of technologies when prompted to identify a technology similar to ClassDojo. Many responses suggested students have a broad, monolithic understanding of educational technology. This suggests the prevalence of a utilitarian *tool* perspective (rather than a *platform* perspective) that may be entrenched by the time that students reach higher education, hampering efforts to inform and educate them in that context.

## Originality

To our knowledge, there are few studies of students' conflation of educational technologies in the extant literature. Furthermore, the *platform* perspective emphasized in this manuscript remains relatively rare in many fields associated with educational technology.

## Keywords

ClassDojo; datafication; educational technology; educational platforms; learning management systems; platforms; privacy

Platforms, Perceptions, and Privacy: Ethical Implications of Student Conflation of Educational Technologies

## Introduction

Researchers, educators, and students often understand educational technologies as *tools*: what Molenda (2008) describes as “means to help people learn that are easier, faster, surer, or less expensive than previous means” (p. 5). Watters (2018) argues that this overly narrow understanding of educational technology—one that assumes that “technology is always bound up in ‘progress’”—is unhelpful in that it “circumscribes much of the analysis one might undertake about systems, structures, histories” (para. 13). Along similar lines, van Dijck and Poell (2018) argue that it is more productive to view educational technologies not as tools but as *platforms* “driven by a complex interplay between technical architectures, models, and mass user activity” (p. 679). The term *platform* is widely used to describe “online content-hosting intermediaries” to suggest that such an intermediary is “designed to facilitate some activity that will subsequently take place”—and to imply “a neutrality with regards to the activity” (Gillespie, 2010 p. 341).

However, a platform is not truly neutral—rather, it “shapes the performance of social acts instead of merely facilitating them” (van Dijck, 2013, p. 29). This shaping becomes increasingly important as “neither neutral nor value-free” platforms play a growing role in public life (van Dijck *et al.*, 2018, p. 3).

The values embedded in platforms become particularly salient when considering the two concepts at the heart of this special issue: datafication and privacy. van Dijck and Poell (2018) describe datafication—“the tendency to quantify all aspects of social interaction and turn them into code” (p. 581)—as one of the primary characteristics of platforms, including educational platforms. For example, Facebook’s famous “Like” button neatly and helpfully quantifies likability; however, this quantification necessarily oversimplifies what it means to “like” something, bending it in directions that favor the platform’s values and priorities (van Dijck, 2013). Thus, it is important to ask whether the quantifications and analytics produced by educational technology platforms truly and fully represent learning as we understand and value it. van Dijck and colleagues (2018) also point to privacy as a value that is frequently relevant in debates about platforms, both in education specifically and in society more broadly. Privacy is understood in a number of ways, even within the context of education (e.g., Heath, 2014; Ifenthaler and Schumacher, 2016); in this study, we understand privacy as “the right to *appropriate* flow of personal information” (Nissenbaum, 2010, p. 127, emphasis in original). This definition’s emphasis on flows of information fits nicely with our focus on platforms (within and between which information may flow) and datafication (a deliberate mechanism of information flow). Furthermore, it is important that this definition acknowledges that flows of information may be either appropriate or inappropriate. Although platforms are understood to improve learning, they must typically collect large amounts of student data in order to work

toward this promise. As purported beneficiaries of these platforms, students are among the stakeholders best suited for determining whether their learning is improving and whether the personal information they give up in exchange is worth the benefit.

However, all of this wrestling with values and understandings is only possible when stakeholders take the time to adopt a holistic *platform* perspective instead of a utilitarian *tool* perspective. Given that students are among the primary users of educational technologies, it is important to include them as key stakeholders in these conversations (Corrin *et al.*, 2019; Slade and Prinsloo, 2013); however, research has also shown that platform users often do not understand the complexities and intricacies of how the platform operates or how their data may be used (e.g., Fiesler and Proferes, 2018; Proferes, 2017; Wyche and Baumer, 2016). In this study, we present and interpret survey data in order to argue that post-secondary students tend to think of the educational technologies they used during secondary school as *tools* rather than *platforms*. Previous research has called on universities to better educate and inform their students on issues related to educational technologies, datafication, and privacy (Jones *et al.*, 2020; Roberts *et al.*, 2016). Our findings suggest that it is not merely that higher education students are unaware of these issues but that they may come to higher education with already-entrenched attitudes that would make it difficult for universities to respond to that call.

## **Background**

Educational platforms abound in the modern U.S. educational landscape. Given this breadth, our intention in this section is not to document all possible platforms or to offer a comprehensive review of the relevant scholarly literature. Rather, our focus is on the context for this study and its purpose, including the ubiquity of platforms and the need to evaluate them critically.

Platforms have become part and parcel of students' learning environments, reflecting the contemporary "information age" (DeSaulles, 2015; Webster, 2014) in which schools are embedded. These platforms are characterized by a diversity of stakeholders and uses. For example, instructors use platforms for the purposes of content management, to organize digital or physical classrooms, and manage behavior; in contrast, students use these same platforms to access content, turn in assignments, and communicate with teachers. In K-12 settings, parents and families use platforms to communicate with teachers and check on the academic progress of their students; school administrators may also use platforms to share in-the-moment community messages or track enrollment. Two prominent examples relevant to this study include the behavior management application ClassDojo, reported on their website to be "loved by over 50 million students and parents" (ClassDojo, n.d.), and the learning management system Canvas, which claims 30 million users on its website (Instructure, n.d.).

While educational platforms were already established in U.S. educational contexts by the end of the 2010s, the COVID-19 pandemic led to further adoption of—and concern about—these platforms. The pandemic shift to *emergency remote teaching* (see Hodges et al., 2020) across educational institutions required the adoption of new platforms (e.g., Greenhow *et al.*, 2021; Pokhrel and Chhetri, 2021), and the urgent nature of the shift likely dissuaded holistic evaluation of these platforms, instead further entrenching utilitarian perspectives of educational technology (see, for example, Reynolds *et al.*, 2022). While long-term educational impacts are yet to be documented, several studies have shown a range of immediate and short-term impacts resulting from the shift from in-person to wholly online education. According to a study by Usher *et al.* (2021), the shift from in-person to remote instruction with no real-time contact led to decreased motivation amongst college level students. Author *et al.* (2023) found that college students held

preconceived notions about the ability of an online-only class platform to foster a sense of social belonging and inclusion—two “necessary social conditions” for learning (Nasir, 2012). In a state-specific study of K-12 level students during COVID-19, Author *et al.* (2022) found that mental health needs increased during online-only schooling, as well as feelings of loss of social connection—again, two critical dimensions of learning. Issues of digital and social inequality also impacted students’ ability to participate in online learning environments during the pandemic, including varying levels of device access and technological skill (Reynolds *et al.*, 2022). Of course, because students learn differently, not all students experienced schooling during COVID-19 in negative ways; the rapid advance in use of a range of online learning technologies also allowed students greater flexibility for engagement in their courses, and many students experienced more autonomy to arrange their schedules (Gonzalez *et al.* 2020). Simply put, schooling during the pandemic cemented the centrality of online educational technologies for schooling in both K-12 and higher education settings.

The ubiquity of and ambivalence about educational platforms—especially since the emergence of COVID-19—makes their critical examination all the more important. van Dijck *et al.* (2018) argue that increasing adoption of platforms “is likely to redefine education as a common good as it gets caught between... ideological sets of values” (p. 119). Sensitive to the dangers of such a redefinition, a number of scholars have engaged in rigorous theoretical critique of educational platforms. However, scholars are not the only stakeholders with regard to educational platform use—accordingly, how other stakeholders such as students, parents, and teachers understand and examine platforms is also important. For example, although much theoretically-driven research (e.g., Manolev *et al.*, 2018; Williamson, 2017a, 2017b) has been critical of the ClassDojo platform, empirical research has found that students, parents, and

educators may not share these concerns (e.g., Burger, 2015; Authors, 2022). We suggest that this may be due to the difference in perspectives described earlier in this paper; that is, students, teachers, and parents may be more likely to see ClassDojo as a utilitarian *tool* whereas critical academics are using a *platform* perspective that asks different questions.

However, this question is further complicated by the relative rarity of the platform perspective even within the academic literature. This is not to say that scholars are not aware of the phenomenon of platforms—or that they do not use the same terminology. However, Gillespie (2010) notes that the term platform is both widely used and meant to be understood in a diversity of ways. For example, Passey and Higgins’s (2011) introduction to a journal’s special issue on “learning outcomes arising from the use of learning platforms” refers to a platform as “a collection of tools brought together to improve a range of aspects of the workings of a school, university or other educational organisation” (p. 329). This is a widely used—and not inappropriate—understanding of the word “platform,” and we emphasize that our purpose in this paper is not to critique or police others’ use of the term. Nonetheless, as valid and valuable as an emphasis on improvement and outcomes may be, we have previously noted that these questions may be at the expense of more holistic and critical considerations; van Dijck (2013) suggested that these considerations may include the ownership, governance, and business models of platforms as well as the content, users, and technology present thereon. Indeed, an improvement and outcome-focused perspective on educational platforms is unlikely to foreground (or even identify) concerns related to privacy and datafication. In contrast, a platform perspective (as modeled by van Dijck, her colleagues, and other scholars) is deliberately attentive to these concerns.

## Purpose

The purpose of our paper is to examine how higher education students think about educational technologies they have previously used—and the implications of this understanding for their awareness of datafication and privacy issues in a post-secondary context. More specifically, we will present the results of a survey in which students were presented with a description of the ClassDojo educational platform and asked to identify educational technologies similar (or identical) to this platform that their secondary teachers and schools employed. Our focus on higher education students' *previous* experience with educational technologies allows for important insight into the attitudes they bring with them as they enter this new stage of education. It is worrying when universities fail to encourage their students to consider technology through lenses of platforms, datafication, and privacy (e.g., Jones, 2019); however, even a university that bucks this trend may face important obstacles if their students arrive with entrenched perspectives on educational technology that prioritize utilitarian views at the expense of holistic considerations. In addition to presenting a summary of the responses themselves, we will describe the range of different educational technologies that students identified in response to this prompt, sorting them into different categories of software that potentially raise different concerns related to datafication and privacy. Building on this description and sorting, we will discuss whether students' conflation of educational technologies is warranted and raise concerns about the ways in which a *tool* perspective developed during secondary education may prevent critical student awareness of datafication as it relates to their higher education.



## **Method**

The data at the heart of this paper were collected from two surveys of undergraduate students conducted in the Spring and Fall semesters of 2020. In this section, we provide methodological context surrounding the surveys.

### **Participants and Research Context**

We conducted this study in the context of a second-year information literacy and critical thinking course at a large research university in the Southern United States. All sections of the course required for-credit research participation, and students in any section could choose to complete our survey to earn course credit. A total of 528 undergraduate students responded to our surveys: 239 completed the Spring 2020 survey and 289 completed the Fall 2020 survey. The course is associated with the university's [department name blinded] and is a required course for students in the technology-focused undergraduate major in that unit; however, it also meets a general education requirement for the broader university and therefore receives students from across the different majors on campus.

As we will describe below, the data from our second survey come from responses to what was originally intended as a screening question within a larger survey instrument. Because we did not collect demographic information about those who did not pass the screening question, we can neither fully nor accurately describe further demographic features of our respondents.

It is important to note that both semesters of data collection were affected by the COVID-19 pandemic. We began distributing the Spring 2020 survey less than two weeks before our university began canceling classes in response to the pandemic, and data collection continued through the end of that semester; likewise, the Fall 2020 semester was characterized by significant adjustments in response to COVID-19. We expect that the increased adoption and use

of educational platforms during this time—and the emergency-driven emphasis on utilitarian perspectives—may have shaped participants’ thinking as they responded to our surveys.

### **Data Collection**

The original purpose of these surveys was to collect data about undergraduate students’ perceptions of and experiences with ClassDojo or other similar technologies during secondary school. The survey included a mix of multiple choice, Likert, and open-ended questions that focused on when and how these technologies were used in their secondary school classes, which features of the apps were used, and student and parent responses to these features. All members of the research team reviewed the initial survey, and we also asked a first-year college student at another institution to review it for us. After revising the survey questions for accessibility and comprehensibility, we disseminated the survey via Qualtrics during the Spring 2020 semester. Based on responses to survey questions asking for participant feedback as well as emergent trends within overall survey responses, we made further revisions to the survey before dissemination in Fall 2020. Our findings related to the intended purpose of the surveys are reported elsewhere (Authors, 2022).

We focus the present analysis on the initial question in each survey, which was meant to verify participants’ eligibility to complete the remainder of the study. In Spring 2020, we began the survey as follows:

You are eligible to take this survey if during your middle or high school education (or equivalent), one or more of your teachers used “ClassDojo” or another type of digital classroom behavior/communication app (or platform).

This passage was meant to ensure that students focused on ClassDojo or similar technologies in their responses. Accordingly, we then asked participants to list the name of the relevant app(s) or platform(s) used by their teacher(s) during middle and/or high school.

However, when we reviewed students' responses to the Spring 2020 survey, we found that students identified a wider range of educational technologies than we had expected. We therefore made further changes to emphasize our focus on ClassDojo and similar platforms. As an example, we modified the eligibility statement to read as follows:

You are eligible to take this survey if during your middle or high school education (or equivalent), one or more of your teachers used "ClassDojo" or another app focused on both:

- behavior management (for example, teachers can award or take away points based on students' behavior)
- communication (between teachers and parents, students and teachers, schools and families, etc.)

We also included a brief message that included the logo of the ClassDojo platform as well as the following description of ClassDojo adapted from Chaykowski (2017):

"Every morning before Cindy Price starts teaching her first graders in New Castle, Delaware, she fires up ClassDojo, a classroom communication app. She checks parent messages, finds out whether any students will be out sick and reads school news. When a child shows a trait like 'amazing thinking' or 'great listening,' she adds a point to the student's avatar—a personalized cartoonish monster—generating a bright ping! that makes classmates perk up. Points come off for disruptive behavior. Twice a day, Price shares class photos or videos with

parents. And during free time, she plays ClassDojo's short personal-growth videos, which use monsters like ClassDojo's excitable green mascot, Mojo, to teach lessons on empathy and perseverance. 'It's helping teachers be successful in the classroom,' she says” (para. 1).

Finally, we changed the open-ended question asking participants to identify an app to a closed list of educational technology apps accompanying the following question: “Which of the following apps did your teachers use? If they used multiple apps, which did they use that is most like the description of ClassDojo on the last page?” Whereas respondents to the Fall survey could identify multiple platforms, respondents to the Spring survey were constrained to a single choice. Table I indicates the apps that were present on the closed list. While this closed list did include technologies that we considered equivalent to ClassDojo, we also included other technologies that had been frequently mentioned in the earlier version of our survey but that we did not consider as qualifying for our study; this decision was made to screen out students who misunderstood the purpose of our study.

### **Data Analysis**

First, we reviewed responses to the open-ended question asked in Spring 2020 regarding the educational technologies participants remembered their teachers using. The primary purpose of this review was to code responses as matching with established platforms. This process involved correcting typos and mistakes (e.g., “Classroom Dojo” was coded as “ClassDojo”), matching older or incomplete names with official branding (e.g., “Reef” was coded as “iClicker Student”), and assigning hyperspecific technology implementations to broader categories (e.g., “BCPS One” was coded as a “district school information system”). We also used some additional codes to interpret other student responses: answers like “none” or “The teacher did not

use any app to teach me” were coded as “NA,” responses like “Do not remember” were coded as “don’t remember,” and ambiguous cases (e.g., when we could not find evidence of an educational technology corresponding with the student’s response) were coded as “unclear.”

We then removed “NA” responses before combining these coded responses with the responses to the Fall 2020 version of the question, which required students to select a specific educational technology from a closed list. Because of the sheer number of distinct platforms that students identified, we used inductive coding to combine the remaining individual technologies into broader categories of software for the purposes of interpretation. We then generated counts for each of the individual technologies as well as the broader categories.

### **Limitations**

We describe the limitations of this study early in the paper to acknowledge that our results—and interpretation thereof—must be understood in this context. As described earlier, the data considered in this paper were originally intended for screening purposes, not for publication; indeed, in our previous publication of survey results (Authors, 2022), we only included the survey results that passed this screening stage. However, the patterns present in these screening data were surprising in a way that we felt warranted further analysis.

Nonetheless, these data are a product of specific methodological choices which may warrant caveats—or offer competing explanations—for some of our conclusions. For example, we acknowledge that the practice of requiring students to participate in research in exchange for a portion of their grade is a frequent target of ethical criticism (Adair, 2001). In this context, we note in particular that students subject to this requirement may be more concerned with simply completing a survey than with critically evaluating an eligibility statement. Furthermore, we acknowledge that the language in our survey instrument (and consent document) did not prime

students to think holistically about educational technologies—and may in fact have inadvertently encouraged a narrower focus on utilitarian aims. Indeed, all survey instruments are inherently imperfect, and our revision of the original Spring 2020 instrument in particular serves as explicit acknowledgment that we believe that participants may have responded differently to a different survey.

Despite these limitations, we are confident that these data lend important insight into how students perceive educational technologies. In particular, whatever the shortcomings of our survey instrument, the breadth of student responses to our question—especially during the Spring 2020 semester, when the question was open-ended—remains notable. Even if our participants’ conflationary, utilitarian approach in their responses were entirely due to our survey design—which we do not believe to be the case—our findings would nonetheless illustrate just how different two superficially similar educational technologies are when considered more holistically.

## **Results**

As described above, our analysis of the survey data included two phases of coding: First, we assigned students’ responses to individual educational technologies; then, we assigned educational technologies to broader categories of software. In this section, we describe the results of both phases of coding.

### **Phase 1: Individual Technologies**

[insert Table I here]

Table I summarizes the individual educational technologies identified in student responses. Students provided a total of 637 responses: 348 in response to the Spring 2020 survey and 289 in response to the Fall 2020 survey. The number of responses to the first survey is

greater than the number of respondents because some students identified multiple technologies. We represented these responses with a total of 59 distinct codes.

The vast majority of these codes represent distinct, specifically identified educational technologies, suggesting that in the aggregate, students saw a wide range of technologies as platforms focused on behavior and communication—and therefore as equivalent to ClassDojo. Although our “unclear” code is largely unhelpful for our analysis, it is nonetheless noteworthy for the way it represents up to 14 additional educational technologies that participants saw as falling in this category. The “don’t remember” code is likewise telling despite (or perhaps because of) its ambiguity; although these students could not recall which educational technologies their schools had used, they were confident that they corresponded with the description that we had provided.

## **Phase 2: Overarching Categories**

Given the sheer scope of the individual technologies identified by respondents to our survey, it is helpful to group them together by commonalities. Table II indicates how many student responses fell into each of nine categories.

[insert Table II here]

We note that these categories are illustrative rather than authoritative in that it is impossible to avoid a certain amount of arbitrary distinction between categories. However, they remain helpful for demonstrating just how much the technologies identified by respondents to our survey differ from each other.

In the remainder of this section, we describe eight of these categories (all except “unclear”), drawing attention to their utilitarian affordances and hinting at deeper platform considerations. We describe them in the order in which they are presented in Table II, with the

most frequently identified category at the beginning and the least frequently identified category at the end. In keeping with this logic, we have more to say about the more prevalent categories of software than the less prevalent ones.

### ***Learning Management and School Information Systems***

We identified as *learning management systems* (LMSs) technologies that were primarily focused on delivering course content, hosting course assessments, and recording student grades. For example, Blackboard and Canvas are widely used in both K-12 and higher education contexts to host either online courses or material for face-to-face courses. Google Classroom is not a traditional learning management system but rather a “wrapper” that brings together other Google technologies into a single platform that can be used in an educational setting. LMSs typically support communication between instructors and students as part of a suite of class-related features.

The term *school information system* (SIS) refers to software that is used to host information about a school and manage personal data about students, including their grades. For example, Skyward and Infinite Campus allow primary and secondary schools to record attendance, students to access their schedules, and parents to see their children’s grades and transcripts. Schools can also use SISs to track other kinds of personal data (demographics, special status, behavioral logs) alongside class-specific information.

SISs and LMSs have historically been understood as two distinct kinds of software. Although both are used to track similar kinds of student data (e.g., grades), an LMS is more focused on content delivery and an SIS is more concerned with managing personal data; thus, a given institution or class might use *both* an LMS and an SIS, and our preference would have been to treat these as two separate categories. However, we also found that a number of



technologies identified by students were described and marketed in terms of both labels, forcing us to combine what we had originally intended to be two categories.

### ***Behavior Management Software***

The category *behavior management software* describes the kind of technology that we intended to investigate through our survey. We understand these technologies as primarily focused on recording and quantifying student behavior. For example, as alluded to above, one of ClassDojo's primary features is the "point total" it keeps for students; educators can award points to students for desired behavior and deduct points for unwanted behavior. The Bloomz app includes similar features, as well as a feature allowing students to be assigned to different groups who compete with each other through their point totals. This focus on points is also often accompanied with a certain amount of *gamification*, the use of game-like mechanics and themes for motivational purposes. For example, the now-defunct ChoreMonster app allowed child users to earn points by completing tasks and trade them in for in-game rewards, and the name of the Classcraft platform is likely meant to invoke popular video games like Minecraft and Warcraft. Although behavior management is the main feature of these technologies, there is also a heavy emphasis on encouraging communication—primarily as a way of communicating student behavior to parents but also for sharing class (or school) announcements and other information.

### ***Communication Software***

Although technologies belonging to the other categories we've described often allow communication between various parties, we identified a number of technologies as being primarily (and perhaps uniquely) focused on facilitating communication. These technologies include videoconference platforms (Zoom), chat apps (WeChat, GroupMe, DingTalk), and email services (including Gmail and Microsoft Outlook). Remind stands out among these technologies

in that it is specifically marketed as an educational technology; indeed, it has many of the features of an app like ClassDojo but notably lacks the point-based behavior tracking system that defined most of the apps in the previous category.

### ***Content Delivery and Assessment Software***

This—admittedly broad—category includes a number of distinctively *educational* technologies. That is, unlike many of the technologies under *communication software*, they are universally and specifically understood as supportive of learning. Although they have some similarities to learning management systems (in that they deliver learning content, assess learning, or both), they are more specific in their aims rather than trying to encompass all of the aspects of an online (or face-to-face) class. For example, many of these technologies are specifically focused on assessment: Socrative provides tools for creating quizzes, collecting performance data, and providing feedback; Kahoot allows students to participate in gamified, competitive assessments; and iClicker Student and PointSolutions allow instructors to poll or quiz their students. In contrast, Khan Academy provides free content related to a wide range of content areas. MathXL—a product of the textbook publisher Pearson—combines assessment and content delivery to provide a “personalized” learning experience; while it has a number of features common to LMSs, it differs in that it is tied to specific mathematics content developed by Pearson and cannot be used to host other kinds of classes.

### ***Classroom Management Software***

We identified three technologies as *classroom management software* because they allow instructors to directly observe, interact with, and control students’ computers in the classroom. For example, Apple Classroom allows teachers in iPad-using classrooms to see what apps their students are using or push documents to students’ iPads. Dyknow and LanSchool allow teachers

to place limitations on what their students can do on their individual computers—and to access students’ screens to monitor their activity.

### ***Office Productivity Software***

The three technologies comprising this category—Google Docs, Microsoft OneNote, and Microsoft PowerPoint—are not explicitly educational technologies, even if they are widely used in learning settings. Their immediate purposes are for document creation (text documents with Google Docs and slideshows with Microsoft PowerPoint) or note taking (Microsoft OneNote).

### ***Social Media Platforms***

Three respondents identified technologies that are best understood as social media platforms. One respondent listed the microblogging platform Twitter (currently—but inconsistently—branded as “X”), which allows users to write (and read) 280-character posts; the others mentioned YouTube, which is focused on uploading and watching video content.

### ***Websites***

Two respondents identified unspecified websites as educational technologies used in their schools. In general terms, websites are collections of documents accessed in a web browser from a computer connected to the internet. The wide range of different purposes that websites serve makes their description here impractical; indeed, respondents may have intended to refer to technologies that would be better described by another category.

## **Discussion**

Our surveying university students about ClassDojo was motivated in part by concerns that are informed by a *platform* perspective. For us, ClassDojo is associated with connotations of behaviorist datafication (and associated profits) and direct communication between teachers and parents (with subsequent shaping of these—and other—relationships). In asking university

students to identify technologies like ClassDojo, we expected that they would have similar associations with the name and description of the app and that they would identify only technologies with similar platform characteristics.

In contrast, our results suggest that university students adopt a *tool* perspective (rather than a *platform* perspective) when thinking about educational technology. By way of reminder, van Dijck and Poell (2018) describe a *tool* perspective as focused on “immediate impact,” as opposed to the *platform* perspective’s recognition of the “complex interplay between technical architectures, business models, and mass user activity” (p. 579). In the following sections, we examine this difference in perspectives through two lenses. First, we ask whether respondents’ adoption of this perspective fully explains the patterns in our data; in other words, how many of the technologies identified by students are indeed similar to ClassDojo when considered in terms of “immediate impact”? Second, whether or not respondents’ perspective is justified, we argue for the need to use a platform perspective to distinguish between the different technologies they identified. Finally, we discuss the implications of students’ recollection of their previous experiences with educational technology for questions of datafication and privacy in the context of higher education.

### **Is Respondents’ Conflation Justified?**

In some ways, the *tool* perspective present in student responses to our survey may be warranted—including because of the specific design of our survey. In trying to invite students to identify technologies similar to ClassDojo, we put particular focus on its affordances related to communication or behavior. Although we were surprised by the breadth of technologies identified by respondents to the Spring 2020 survey, it is true that most of the technologies they identified have an “immediate impact” related to the two purposes that we ourselves ascribed to

ClassDojo in the survey instrument. That is, while *behavior management software* focuses on both behavior and communication, other categories of software (most obviously including *learning management and school information systems*, *communication software*, and *classroom management software*) are also associated with one of these two purposes. Indeed, in this context, even the identification of *social media platforms* in student responses has a certain logic to it; while we were personally surprised that students would see Twitter as equivalent to ClassDojo, it is nonetheless true that schools and school districts use this technology as a communication mechanism (Kimmons *et al.*, 2018; Michela *et al.*, 2022). For all the important differences between these categories of software—which we will address in the following section—there is a certain logic in many of these responses from a *tool* perspective.

Yet, respondents seemed to go even further in their conflation of platforms than might be warranted by the design of our survey instrument. For example, in the Fall 2020 survey, even after we specified that students should identify technologies associated with *both* communication *and* behavior management, a plurality of students ( $n = 97$ ; 33.56%) identified Canvas, with Google Classroom ( $n = 76$ ; 26.30%) coming up in second place. While these learning management systems could conceivably be used for behavior management, we are unaware of any systematic use of the software for these purposes, suggesting a lack of critical distinction on the part of our respondents. This possibility is further emphasized by data suggesting that at least some students think of *all* educational technologies as falling within a single, monolithic category. This is perhaps most evident in some of the least helpful responses to our Spring 2020 survey; for example, the eight “don’t remember” answers that we coded may well suggest that students remember some kind of technology being used in their classroom but don’t recall much about it (indeed, references to a “dictionary app” or a “website” are only slightly less

ambiguous). Even some of our discarded data supports such a conclusion: For example, earlier in the paper, we identified “The teacher did not use any app to teach me” as an example of a student response that was coded as “NA.” Although this response was removed from our analysis, it is noteworthy that we did not ask students to identify technologies used for teaching or learning—this respondent understood a reference to teachers’ use of ClassDojo as a broad use of any educational technology. Other respondents may have done the same, as indicated by the emergence of the *content delivery and assessment software* and *office productivity software* categories during the second phase of our analysis. While these categories certainly qualify as *educational* technologies, it is difficult to imagine them as valid responses to our survey unless students approached the survey with a conceptually broad consideration of all learning technologies rather than the specific kinds we were asking after.

### **The Importance of a Platform Perspective**

Even in cases where respondents’ *tool* perspective holds a certain amount of logic, there are important disadvantages of this perspective as compared to the *platform* perspective that we have discussed in this paper. Consider, for example, a comparison of Remind (which we coded as *communication software*), ClassDojo (which we coded as *behavior management software*), and Dyknow (which we coded as *classroom management software*). As we implied in the previous section, these three technologies do have some undeniable similarities when considered in terms of utilitarian impact, the main focus of the *tool* perspective on educational technologies. That is, Remind has a number of communication features in common with ClassDojo, and ClassDojo and Dyknow are both focused on encouraging and discouraging certain behaviors.

However, even a cursory examination of these technologies beyond their immediate purposes reveals important differences between them in terms of datafication and privacy. Both

Remind and ClassDojo engage in datafication: some paid Remind plans allow schools to quantify and analyze “engagement” (i.e., communication patterns) between stakeholders, whereas any use of ClassDojo’s point system necessarily represents student behavior in the form of a quantitative, seemingly straightforward metric. Both of these approaches to datafication run the risk of creating an often-unwarranted “aura of truth, objectivity, and accuracy” (boyd and Crawford, 2012, p. 663); however, we suggest that ClassDojo’s approach is particularly worrisome. A persistent quantification of student behavior makes the surveillance of students a norm that they must conform to in order to be seen as successful (Manolev *et al.*, 2018). Furthermore, it sets aside the fact that “data are not neutral or objective” (D’Ignazio and Klein, 2020, p. 149); the seeming objectivity of ClassDojo points runs the risk of masking racial and other discrepancies in how teachers award or deduct those points (Lu *et al.*, 2021).

Likewise, ClassDojo and Dyknow are both associated with concerns about privacy, but it is important to acknowledge how these concerns differ. One persistent concern about ClassDojo (e.g., Williamson, 2017a) is the lack of student control over the personal information entered into the app, which may easily transmit data to parents, school administrators, other teachers, and the ClassDojo company itself. However, Dyknow is even more striking for the ease with which it transmits data from students to other stakeholders; by allowing teachers to see their students’ screens, the software serves as a literal panopticon, forcing students to yield all personal information related to their computer activity to other stakeholders. While computer-related distractions during class are legitimate concerns for any educator, we echo Eaton’s (2021) concern that digital technologies allow educators to be invasive in ways that would never be tolerated in an analog setting—and that educators would never allow their students to monitor their activity in the same way. Whereas ClassDojo requires at least some agency on the part of

the teacher to record personal information, Dyknow allows for the possibility of effortless, far-reaching, consistent surveillance of students.

We conclude this section by echoing that even this comparison is merely a cursory examination of differences between three technologies. As alluded to earlier, van Dijck's (2013) critical examination of web platforms considered the content, users, and technology present on each platform as well as the ownership, governance, and business models that exist behind the scenes. A full consideration of any of these three technologies (not to mention a careful comparison of the three) would require a length and depth that are impractical here—but could raise additional concerns about these technologies as well as further demonstrate why they should not be considered as equivalent to each other (despite some utilitarian similarities).

### **Implications for Higher Education**

Although this study involved surveying students enrolled in *higher education*, we also specifically asked them to reflect on their experience with educational technology during their *secondary schooling*. Thus, our study stands in contrast with other studies that have specifically asked post-secondary students about educational technologies, privacy, and datafication at their institutions of higher education (e.g., Ifenthaler & Schumacher, 2016; Jones *et al.*, 2020; Roberts *et al.*, 2016). Yet, our findings echo and expand the findings from this complementary line of research in important ways. For example, previous studies have found that higher education students are largely unaware of the ways that their institutions are collecting data about them, with the studies themselves sometimes serving as “the first time they had encountered the idea that their university was collecting and analyzing information about them” (Jones *et al.*, 2020, p. 1051; see also Roberts *et al.*, 2016). Our own conclusion that students do not consider educational technologies in holistic ways not only reinforces these studies' findings but also



expands on their concerns: That is, our study emphasizes that the collection and analysis of students' data as well as students' relative unawareness of this phenomenon both begin long before they reach higher education.

Rubel and Jones's (2016) argument that student data privacy is closely tied to autonomy is particularly relevant here. As a general rule, higher education students have reached the age of majority whereas secondary students have not. While we would reject arguments that our participants did not enjoy or exercise autonomy during their secondary schooling, we doubt that they were *treated* as autonomous for the purposes of consenting to any of the technologies that they identified in our survey. Indeed, Rosenberg and colleagues (2022) note that primary and secondary schools' invasive sharing of student data with platforms—in their case, the posting of personally identifiable information to social media—take as permission parents' or guardians' consent to those uses, perhaps through an ambiguous “media release form.” Thus, while it is reasonable to expect institutions of higher education to value student consent when using their data (Corin *et al.*, 2019; Jones, 2019), it is important to note that students may not be well practiced at giving that consent—not only because universities have not clearly asked for their consent (Jones *et al.*, 2020; Roberts *et al.*, 2016), but because their previous educational experiences have not treated them as capable of so doing. In short, not only must educational institutions afford students privacy so that they can develop autonomy, but they must help them develop the necessary autonomy to consider questions of privacy; this autonomy cannot be expected to emerge fully formed once students begin higher education.

Our study therefore demonstrates the ways in which concerns about datafication and privacy in higher education are intertwined with concerns about datafication and privacy in secondary—and, by extension, primary—educational contexts. While there are unique concerns

and considerations related to universities' use of educational technology platforms, the breadth of educational technology evidenced by our respondents may indicate a habituation to educational technology platforms that may dull students' critical awareness before they even reach higher education. In this same vein, our respondents' seeming adoption of a *tool* perspective toward educational technologies may represent a deep-seated attitude that has been reinforced over a decade or more of previous schooling. Furthermore, schools' increased reliance on educational technology platforms during and after the *emergency remote teaching* associated with the COVID-19 pandemic makes it likely that future students will be even more habituated to these platforms and attitudes than those who responded to our survey. Thus, while we echo previous authors' calls for universities to educate and inform their students about these issues (Jones *et al.*, 2020; Roberts *et al.*, 2016), we emphasize that those institutions who take up these calls may have to contend not just with a blank slate of ignorance about these phenomena but rather with entrenched, practiced attitudes toward educational technology that discourage critical awareness of these issues. Universities' obligation toward their students in this regard thus extends to any formal partnerships with local schools, to education (and other) researchers focused on primary and secondary schools, and to instructors training teachers and administrators at those schools.

### **Conclusion**

Our analysis suggests that the higher education students who responded to our survey adopt a *tool* perspective (rather than a *platform* perspective) when considering educational technologies they had previously used. Although this perspective is somewhat warranted (especially considering the design of the survey instrument), some of our data also suggest that these students may think about educational technologies as belonging to a single, monolithic

category. More importantly, even when there is some logic behind students' conflation of technologies, such a conflation fails to make important distinctions that have consequences in terms of privacy and datafication. While our respondents' conflation was in the context of a recollection of technologies they experienced during their secondary education, we have no reason to believe that they would not continue to conflate (rather than critically examine) the technologies employed at our institution of higher education, which raise their own concerns about privacy and datafication. Indeed, our findings emphasize that institutions of higher education that wish to better educate and inform their students will have to contend with previous experiences and entrenched attitudes—and would benefit from encouraging change at the primary and secondary levels. The importance of responding to previous experiences and entrenched attitudes becomes even more important in the wake of the COVID-19 pandemic, which has increased use of educational platforms.

Across contexts, this lack of student awareness matters because understandings of form and function often go hand-in-hand. A basic understanding of what platforms are and what they do is clearly required to even consider the possibility that students could become more active and exercise more agency in awareness of datafication and their management of privacy settings. Yet, our data suggest that even this basic understanding is not only lacking at the higher education level but also implicitly encouraged by earlier experiences. Without these baseline understandings, we conjecture, students move further and further into what has been referred to as *data resignation* (Pangrazio and Sefton-Green, 2022). This term describes a situation in which students generally recognize the over-datafication of their lives but take little to no steps to exercise individual agency within their digital information landscape because they understand the benefits of participating online as outweighing the costs or risks. Such a stance is problematic

on many dimensions, including but not limited to issues related to coerced online behavior, succumbing to filter bubbles and echo chambers, and even becoming victims of identity theft and mal-intended actors.

However, even if students abandon data resignation and take a more agentic stance toward one's privacy when using educational platforms, this cannot wholly solve such aforementioned problems. Whereas students have a certain amount of agency in choosing what technologies they use on their own time, this agency is restricted in important ways when it comes to educational technologies. Previous research has emphasized the way that universities make decisions about technology, datafication, and privacy for their students (and instructors) without their consent (e.g., Jones, 2019; Paris et al., 2021). Likewise, decisions to use ClassDojo, Canvas, Dyknow, and other technologies identified by our respondents are overwhelmingly made at the class, school, and district level, habituating students to the idea that even if they have concerns about privacy and datafication, they may not have the choice to opt out of platform use. Furthermore, Proferes (2017) describes Twitter users' learning about that platform as a process of reading "pages upon pages upon pages of policy documentation," trying to understand "a sometimes opaque platform," and "scouring... initial public offering documentation" (p. 11). Educational platforms are not necessarily any easier to understand, with Paris et al. (2021) similarly describing "vague" and "minimal, opaque information" contained within the terms of service, privacy policies, and university contracts of these platforms (p. 716). In this way, we echo Proferes's argument that the user is not to blame for their unawareness; rather, our findings suggest increased responsibility of schools and companies to more fully consider privacy and datafication as they relate to the students they claim to serve. As relevant as this is at the level of

higher education, students' previous experiences will surely shape the attitudes they bring to those institutions, emphasizing that these concerns extend far beyond universities.

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Table I: Educational technologies identified by survey respondents

Educational Technology	Spring 2020 Total	Fall 2020 Total	Overall Total
Canvas*	30 (8.62%)	97 (33.56%)	127 (19.94%)
ClassDojo*	84 (24.14%)	42 (14.53%)	126 (19.78%)
Google Classroom*	44 (12.64%)	76 (26.30%)	120 (18.84%)
Infinite Campus*	19 (5.46%)	21 (7.27%)	40 (6.28%)
Schoology*	18 (5.17%)	13 (4.50%)	31 (4.87%)
Edmodo*	14 (4.02%)	11 (3.81%)	25 (3.92%)
Remind*	12 (3.45%)	13 (4.50%)	25 (3.92%)
Blackboard*	10 (2.87%)	8 (2.77%)	18 (2.83%)
unclear	14 (4.02%)	0 (0.00%)	14 (2.20%)
Kahoot	12 (3.45%)	0 (0.00%)	12 (1.88%)
Moodle*	8 (2.30%)	4 (1.38%)	12 (1.99%)
don't remember	8 (2.30%)	0 (0.00%)	8 (1.26%)
Skyward*	5 (1.44%)	2 (0.69%)	7 (1.10%)
Edline*	5 (1.44%)	0 (0.00%)	5 (0.78%)
GroupMe	3 (0.86%)	0 (0.00%)	3 (0.47%)
PowerSchool	3 (0.86%)	0 (0.00%)	3 (0.47%)
Quizlet	3 (0.86%)	0 (0.00%)	3 (0.47%)
RenWeb	3 (0.86%)	0 (0.00%)	3 (0.47%)
SMART	3 (0.86%)	0 (0.00%)	3 (0.47%)
district school information system	3 (0.86%)	0 (0.00%)	3 (0.47%)
iClicker Student	3 (0.86%)	0 (0.00%)	3 (0.47%)
Apple Classroom	2 (0.57%)	0 (0.00%)	2 (0.31%)
DingTalk	2 (0.57%)	0 (0.00%)	2 (0.31%)
DyKnow	2 (0.57%)	0 (0.00%)	2 (0.31%)
ProgressBook	2 (0.57%)	0 (0.00%)	2 (0.31%)
Showbie	2 (0.57%)	0 (0.00%)	2 (0.31%)
WeChat	2 (0.57%)	0 (0.00%)	2 (0.31%)
YouTube	2 (0.57%)	0 (0.00%)	2 (0.31%)
email	2 (0.57%)	0 (0.00%)	2 (0.31%)
website	2 (0.57%)	0 (0.00%)	2 (0.31%)
Bloomz	1 (0.29%)	0 (0.00%)	1 (0.16%)
BrainPOP	1 (0.29%)	0 (0.00%)	1 (0.16%)
ChoreMonster*	1 (0.29%)	0 (0.00%)	1 (0.16%)
Classcraft*	0 (0.00%)	1 (0.35%)	1 (0.16%)
Gmail	1 (0.29%)	0 (0.00%)	1 (0.16%)
Google Docs	1 (0.29%)	0 (0.00%)	1 (0.16%)
Hero*	0 (0.00%)	1 (0.35%)	1 (0.16%)
Jupiter Ed	1 (0.29%)	0 (0.00%)	1 (0.16%)
Khan Academy	1 (0.29%)	0 (0.00%)	1 (0.16%)
LanSchool	1 (0.29%)	0 (0.00%)	1 (0.16%)

MathXL	1 (0.29%)	0 (0.00%)	1 (0.16%)
MiStar	1 (0.29%)	0 (0.00%)	1 (0.16%)
Microsoft OneNote	1 (0.29%)	0 (0.00%)	1 (0.16%)
Microsoft Outlook	1 (0.29%)	0 (0.00%)	1 (0.16%)

Table I cont'd

Microsoft PowerPoint	1 (0.29%)	0 (0.00%)	1 (0.16%)
Nearpod	1 (0.29%)	0 (0.00%)	1 (0.16%)
Option C	1 (0.29%)	0 (0.00%)	1 (0.16%)
PAWS	1 (0.29%)	0 (0.00%)	1 (0.16%)
PointSolutions	1 (0.29%)	0 (0.00%)	1 (0.16%)
Pupil Path	1 (0.29%)	0 (0.00%)	1 (0.16%)
Socrative	1 (0.29%)	0 (0.00%)	1 (0.16%)
Student Connection	1 (0.29%)	0 (0.00%)	1 (0.16%)
Teacher's Assistant	1 (0.29%)	0 (0.00%)	1 (0.16%)
Twitter	1 (0.29%)	0 (0.00%)	1 (0.16%)
Xuexitong	1 (0.29%)	0 (0.00%)	1 (0.16%)
Zoom	1 (0.29%)	0 (0.00%)	1 (0.16%)
dictionary app	1 (0.29%)	0 (0.00%)	1 (0.16%)
eSchoolPlus	1 (0.29%)	0 (0.00%)	1 (0.16%)

\* technology was included in the closed question for the Fall 2020 survey

Table by authors.

Table II: Software categories identified by survey respondents

Software Category	Spring 2020 Total	Fall 2020 Total	Overall Total
learning management and school information systems	172 (49.43%)	232 (83.15%)	404 (64.43%)
behavior management software	87 (25.00%)	44 (15.77%)	131 (20.89%)
communication software	24 (6.90%)	13 (4.66)	37 (5.90%)
content delivery and assessment software	29 (8.33%)	0 (0.00%)	29 (4.63%)
unclear	23 (6.61%)	0 (0.00%)	23 (3.67%)
classroom management software	5 (1.44%)	0 (0.00%)	5 (0.80%)
office productivity software	3 (0.86%)	0 (0.00%)	3 (0.48%)
social media platforms	3 (0.86%)	0 (0.00%)	3 (0.48%)
websites	2 (0.57%)	0 (0.00%)	2 (0.32%)

Table by authors.