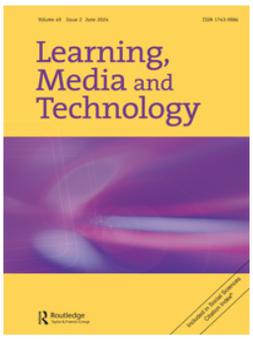

Learning, Media and Technology

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/cjem20

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To cite this article: Judith Hangartner, Daniel Hürzeler & Noemi Aebli (17 Jun 2024): Everyday approaches to platform-mediated personalized learning in secondary schools, Learning, Media and Technology, DOI: 10.1080/17439884.2024.2367051

To link to this article: https://doi.org/10.1080/17439884.2024.2367051

Published online: 17 Jun 2024.

LEARNING, MEDIA AND TECHNOLOGY
https://doi.org/10.1080/17439884.2024.2367051

Routledge
Taylor & Francis Group

Everyday approaches to platform-mediated personalized learning in secondary schools

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ABSTRACT

Despite the ubiquity of platforms in schools, few scholars have examined the impact of these platforms on face-to-face classroom practices. Considering the pervasive claim that platforms drive the personalization of learning, our exploratory study analyses how teachers engage platforms in personalized learning settings in Swiss secondary schools. We focus on teachers' broader pedagogical concepts that inform platform-mediated personalized learning practices. In contrast to techno-enthusiastic claims – and critical scholars' concerns – that datafication drives learning personalization, teachers in our case studies use platforms in ways that align with their pedagogical values while allowing them to retain control over classroom activities. Thereby, teachers and platforms co-produce ambiguous personalized learning settings involving conflicting conceptions of (self-) governance and autonomy. The findings from this study warn against deducing platform effects from their affordances alone and suggest the need to study the enactment of platforms in situated classroom practices.

ARTICLE HISTORY
Received 24 May 2023
Accepted 7 June 2024

KEYWORDS
Digital platforms; personalized learning; case study; secondary education; Switzerland

Introduction

Strengthened by the need for distance learning during the pandemic, digital platforms now 'apprehend[s] the entire modern landscape of educational technology' across all educational levels (Perrotta and Pangrazio 2023, 3). A web of platforms provides services for school administration, classroom management, learning applications, online assessments, adaptive tutoring, and communication with parents (Pangrazio, Selwyn, and Cumbo 2022). Digital platforms constitute a data infrastructure 'designed to organize interactions between users […] geared toward the systematic collection, algorithmic processing, circulation, and monetization of user data' (van Dijck, Poell, and de Waal 2018, 4). The concern with platforms as infrastructure has given rise to a perspective on platformization as a techno – cultural process that transforms social and cultural practices by reorganizing them around platforms – while these practices, vice versa, shape platforms as socio – technical constructs (Poell, Nieborg, and van Dijck 2019). Through their technical interoperability, nested platforms build commercialized, intricate, and dynamic ecosystems that blend technical and social values as well as public and private concerns with economic interests (van Dijck, Poell, and de Waal 2018).

Against the techno-optimistic claims that digital platforms are essential for enhancing the quality of education, critical platform researchers scrutinize the wider and unintended effects that digital platforms enact in educational institutions (Nichols and Garcia 2022). These studies trace the

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complex relationships between platform infrastructures and learning, social justice, and democracy (Perrotta and Pangrazio 2023). Significant concerns revolve around automation and datafication, the pedagogical logic underpinning automation, the growing dominance of Big Tech proprietary platforms, and related ethical questions (Williamson, Macgilchrist, and Potter 2023). The data collected by platforms raises worries about data-based surveillance and associated commodification, the erosion of individual privacy, as well as algorithmic biases and discrimination (Lai, Andelsman, and Flensburg 2023; Lupton and Williamson 2017; Williamson, Macgilchrist, and Potter 2023). The accelerating dominance of a few major tech companies, such as *Google*, *Apple*, *Amazon*, and *Microsoft*, prompts concerns about the corporations' power and influence that challenges the pedagogical autonomy of educational institutions and teachers (Kerssens and Van Dijck 2022). These platforms provide digital ecosystems that seamlessly connect educational software suites (Google Workspace for Education, Apple Classroom, and *Microsoft Office* 365 for Education) with physical devices and cloud services for data storage. These vertically integrated proprietary ecosystems virtually lock schools into the commercial products that extract and monetize the educational practices (Kerssens and Van Dijck 2021; Krutka, Smits, and Willhelm 2021; Lindh and Nolin 2016). Hence, corporatization, datafication, and platformization mutually reinforce each other, creating social risks related to privacy, surveillance, and control.

The trend for the near future is the closer alliance of data-based infrastructures and data science with behaviourist pedagogical theories that foster a performance-based pedagogy (Knox, Williamson, and Bayne 2020). The platforms 'collect, collate and calculate' student data to monitor student activities, and these data-driven calculating technologies, in turn, provide automated feedback, which shall facilitate and guide learning (Williamson 2014). Thereby, the data-driven governance of schools is transferred into the classrooms and merges with educational practices (Macgilchrist, Hartong, and Jornitz 2023). Platformization, consequently, is entwined into a profound transformation that 'is likely to redefine education as a common good as it gets caught between two ideological sets of values: *Bildung* vis-à-vis skills, education versus learnification, teachers' autonomy versus automated data analytics, and public institutions versus corporate platforms' (van Dijck, Poell, and de Waal 2018, 119). Data-driven personalization is the mantra of this transformation, although the empirical evidence to support this claim is missing (ibid., p. 135). Given the ubiquitous claims that platforms enable the personalization of learning, there is a lack of on-the-ground studies that trace how platform-mediated personalization unfolds in classrooms. This article contributes to the analysis of the relationship between platforms and personalization. By studying platform-mediated practices in classrooms in Switzerland, we explore the everyday ways platforms are employed to organize personalized learning. Before discussing these practices, we consider the contribution of ethnographic studies to platform research and then trace the articulation of discourses about personalization and platformization.

Platform performances in classrooms

To date, critical platform scholars have analysed the effects of digital platforms in education primarily on a general level, while few researchers have empirically studied human interactions with platforms in classrooms (Hartong and Decuypere 2023). Pink et al. (2022, 8) argue that by focussing on the effects of technologies without acknowledging human involvement, critical scholarship tends to reify the datafication it criticizes. Instead, the authors suggest re-humanizing the perspective on digital technologies by studying the actual practices of everyday automation.

The emerging ethnographic studies that trace schools' interactions with platforms qualify the perspective on datafication and dataveillance by highlighting the mundane practices encountered in schools (Selwyn 2022). Ethnographic classroom research points to the taskification and fragmentation of learning processes, noting the friction and breakdowns in the interactions with digital tools (Alirezabeigi, Masschelein, and Decuypere 2020; Rabenstein et al. 2022; Wagener-Böck et al. 2022). These studies thereby indicate the platforms' agential power by co-constituting the contents, forms, and temporal structuring of educational practices and teachers' work (Alirezabeigi, Masschelein,

and Decuypere 2022; Cone 2021; 2023). Furthermore, the everyday interactions with platform-mediated, game-like learning tools and channels for communicating with students and parents are documented as incremental and ambiguous rather than as disruptive changes in pedagogy (Cerratto Pargman 2019; Förschler et al. 2021; Hangartner, Weidmann, and Fankhauser 2022). Wagener-Böck et al. (2022) analyse automated practices that they encountered in classrooms as 'doing with' automation that the authors term 'symmation'; in other words, teachers and students co-produce what looks like the automated 'doings' of digital technologies. While these ethnographies qualify the claim of disruptive change in education, they emphasize that seemingly innocuous technological conditions can thoroughly infiltrate and incrementally transform education (Nichols and Garcia 2022; Selwyn 2022). Following Ingold's (2000) dwelling perspective, Perrotta and Pangrazio (2023, 9) suggest that school actors might to live with the new demands of the platform-mediated environment in the human attempt to 'make a home'. As platforms are embedded in various cultural contexts, particular governing regimes, and varying degrees of autonomy enjoyed by school actors, their impact can vary radically across different locales (Hartong and Piattoeva 2021).

We aim to contribute to studying the situated, culturally specific enactments of platforms in classrooms. Inspired by Sefton-Green's (2021, 6) notion of 'pedagogic device', we focus on the relationship between platform-mediated practices of personalization and their underpinning pedagogical concepts. The discussion seeks to uncover the relationship between platforms, personalized learning settings, and the pedagogical intentions that guide these platform-mediated practices.

Personalized learning and its forerunners

At the turn of the millennium, 'personalized learning' emerged as a key educational policy term in England and was subsequently championed by the OECD; its spread is accompanied by the claim that it better equips students for the evolving demands of the knowledge economy (Mincu 2012). While borrowed from marketing, the term personalization has developed an appeal in education by being associated with nostalgic notions of child-centred education (Hartley 2009). Although the concept remains fuzzy, it is an umbrella term to address educational approaches that promise to meet students' individual needs and denounce teacher-centred instruction as outdated (Schmid and Petko 2019). However, empirical studies have not verified the promised improvements in teaching quality and learning outcomes, partially due to the heterogeneous practices involved in the studies (Shemshack and Spector 2020).

Personalized learning builds on and transforms previous reform approaches that sought to promote student autonomy (Hangartner et al. 2024). The international reform movement emerged in the early twentieth century, known as *new education* in the UK, *Reformpädagogik* in Germany, *éducation nouvelle* in France, and *progressive education* in the USA (Oelkers 2010). In the wake of the emancipatory movements of the post-1968 period, child-centred education and anti-authoritarian, democratic, or, more radically, de-schooling approaches enjoyed a revival in counter-cultural milieus (Hartley 2009). The call to tailor education to learners' individual needs has more recently become prevalent in educational policy and practice discourses. Personalized learning is hearkening back to these earlier reform approaches while it transforms their values. Whereas in prior approaches, the autonomy granted was oriented towards emancipation and self-fulfilment, it is now more likely to be related to the self-responsible and – reflexive organization of, often predefined, learning tasks (Fielding 2012; Hangartner et al. 2024). Discourses regarding personalization demonstrate a concern with the neoliberal agendas of 'choice and voice', performance standards, and 'what works', thereby marginalising ethical and social questions about the aims of education as a public good (Fielding 2012).

Personalized learning is situated amidst a discourse that increasingly equates education with the individual's learning and reconceptualizes teaching as the facilitation of individual learning processes (Biesta 2015). This shift is accompanied by reorienting the spatial imagery from a disciplinary classroom to an environmental understanding of education (Simons and Masschelein 2008). The

disciplinary classroom normalizes students through classification and a linear temporal–spatial organization that allows teachers to surveil students' bodies and assess their development according to the collective norm (Foucault 1977). Conversely, the logic of the learning environment frees students from homogenising norms, recognizing them as unique individuals with personal needs and learning trajectories (Simons and Masschelein 2008). In the learning environment, 'the learner is no longer in need of surveillance and normalising instruction, but is in need of permanent monitoring, coaching and feedback' (Simons and Masschelein 2008, 693). While it seems tempting to welcome personalized learning as the ultimate liberation of students from a discipline-based educational system, it emerges rather as a new governing technology that articulates the learner's self-direction with new forms of pedagogical guidance (Simons 2021).

Although personalized learning predates platformization, its growing popularity can only be understood in the context of the accelerated growth of digital infrastructures in schools (Kerssens 2023; Shemshack and Spector 2020). The current educational paradigm purports that platforms automate the work of personalization through algorithmic sorting and predictive analytics, thereby recognizing learners' performance levels and behaviours (Jørnø, Andersen, and Gundersen 2022). These data-driven 'transactional pedagogies' enact a form of soft governing technology that activates learners' self-regulation, – control, and – direction and thereby governs them by their own capacities (Williamson 2014). Hence, platforms contribute to neoliberal paradoxes of freedom by inviting students to understand their learning as an autonomous meaning-making activity, while algorithmic adaptivity 'nudges' them towards behaviours that are predefined by learning analytics, thereby undermining their autonomy (Grimaldi and Ball 2021). The platform-mediated personalization equally affects teachers' agency and autonomy, as they are required to inform their practice through visualizations and data provided by dashboards, which demand a behaviouristic, performative pedagogy based on continuous monitoring, comparison, and competition (Jivet et al. 2018; Kerssens 2023).

While these critical analyses focus on the data-driven guidance of teachers and students, in what follows, we discuss everyday forms of how platforms are involved in classroom practices. In the platform-mediated settings of personalized learning that we encountered in an exploratory study in Switzerland, data dashboards did not play a prominent role; instead, teachers used platforms for 'everyday automation' (Pink et al. 2022) to organize and manage individual student practices. Building on Pink et al. (2022) and Wagener-Böck et al. (2022), we are interested in human – particularly teacher – agency in producing the automated platform 'doings'.

Explorations of platform-mediated personalization in Switzerland

In the wake of international policy discourses in the early years of the new millennium (OECD 2006), personalized learning approaches have gained popularity in schools in the German-speaking part of Switzerland (Schmid and Petko 2019).[1] These approaches are connected to the aims of recognizing students' individual needs and promoting their autonomy by emphasizing their responsibility for self-directed and reflexive completion of school tasks (Hilbe and Herzog 2011). The focus on student self-direction is prominently promoted in the new curriculum (*Lehrplan 21*)[2] and is reflected by the growing number of private and public schools that advertise forms of personalized learning in their pedagogical profiles (Schmid et al. 2022). Increasingly, schools use digital platforms to support the organization of personalized learning (Schmid, Pauli, and Petko 2022). More than a decade ago, around half of Swiss schools were already running a digital platform – almost exclusively Educanet[2], which was made available to schools free of charge (Barras and Petko 2007). The platforms' main features used in schools were email and data storage, while the pedagogical potential of platforms was not being fully exploited (Petko 2010). Paradoxically, this publicly provided platform was – due to the growing number of commercial platforms available for schools – discontinued in 2020.[3] To support the communication with students and parents, those schools that did not yet run a digital platform introduced proprietary platforms, especially *Microsoft* 365, during the pandemic (Huber and Helm 2020). The use of digital platforms in

classroom is commonly legitimized by their potentials for individualization, however without clarifying the pedagogical aims that are being pursued (Döbeli Honegger 2022). So far, little research has been conducted on how platforms are used to support personalized learning in face-to face classrooms (Schmid, Pauli, and Petko 2022).

Consequently, we undertook an exploratory study to acquire firsthand insight into the diversity of platform-mediated practices in Swiss classrooms. Based on expert recommendations, we selected six schools, visited exemplary classrooms, and conducted in-depth interviews with teachers and headteachers.[4] We did not intend to focus exclusively on personalized learning; however, all the schools we visited used platforms for personalized learning. In the following, we present the three schools that featured pronounced differences in teachers' pedagogical approaches to personalized learning. These schools are in rural areas in different Swiss cantons and have a relatively homogeneous student composition from middle-class or lower-middle class backgrounds. All maintain a simple but efficient digital infrastructure and provide their students with a personal laptop. The schools had installed proprietary platforms before the pandemic, although the exceptional circumstances intensified the use of the digital infrastructure. Notably, however, the increased use of digital platforms did not lead to rich digital student practices in the classrooms we observed. Rather, teachers and students carefully sought a balance between digital and analogue resources.

Case study 1: platform-mediated individualized organization in the learning studio

The school promotes its pedagogical profile on its website with the slogan, 'Individualization strengthens student self-responsibility, enhances motivation, and leads to success'. To foster individualization, the school merges students from three grades and different performance levels instead of teaching classes to students of the same age and performance level. During our visit, we acquired insight into the learning studio, which occurs for two or four classes every morning:

> The two connected rooms of the learning studio are spacious and host only 18 students this morning, who sit at large desks aligned into rows. Shelves prevent eyesight and interaction between students sitting opposite

Figure 1. Spatial framework of the learning studio in School 1.[5]

each other, thus conveying a sober working atmosphere. The laptops are on the tables; some are opened, showing the Escola Learning World platform with the tasks to be done. Students mainly work on paper worksheets; some use the math book and the calculator. What thwarts the image of an open-plan office are the two teachers, who are supported by two assistants, circulating between the two rooms of the learning studio, who advise students for conspicuously long periods. The teachers sit on the free chairs beside the students, giving the impression of communicating at eye level. While the teachers communicated intensively with individual students, the peers, except for two girls sitting together, hardly interacted with each other this morning. (researcher's fieldnotes; Figure 1)

This brief glimpse into the learning studio atmosphere demonstrates that platform-mediated personalization in this school focusses on students' individualized task processing with extensive support from several teachers. In his presentation, the school's headteacher, whom we call Robert, highlighted the school's far-reaching individualized organization, with the platform assigning personal timetables to each student. The school uses bundled administration and management services as well as the Learning World platform, all of which are provided by the Swiss ICT company Escola.[6] The Learning World tool was conceptualised by a network of school leaders who prioritized personalized learning and was designed to meet their needs.

As requested by the headteacher, student Noah explained how he uses Learning World (Figure 2):

Noah:	We have a website that we can access via the school website. Each student has a login, so you can just see your own stuff. […]
Interviewer:	So, when you come to school in the morning, you first start Escola?
Noah:	Exactly. Then, we have the second website, Learning World. There, we have the learning tasks. All teachers can see what I have done or not done, and I only see what I'm doing. Here, you see the current deadlines; yes, there are a few. You can see that some of the other dates are still far away. Here, red is not good because you are too late or forgot it. However, it might be that a teacher has not yet corrected your task on that day or hasn't checked it yet. The blue tasks are not due today but may have to be done by tomorrow or next week. And then there are the yellow tasks, which I must finish today.
Interviewer:	How do you work with it?
Noah:	For example, here, this math task. I click on it and then see what I must do. So, I see which page numbers of the math books I must do and what I can leave out. I then see at the front how long it should take me. Here, I was a bit too slow because it's already red. It also tells me the order in which I must do the tasks. I might have to do something in the math book first and then repeat it in the workbook.

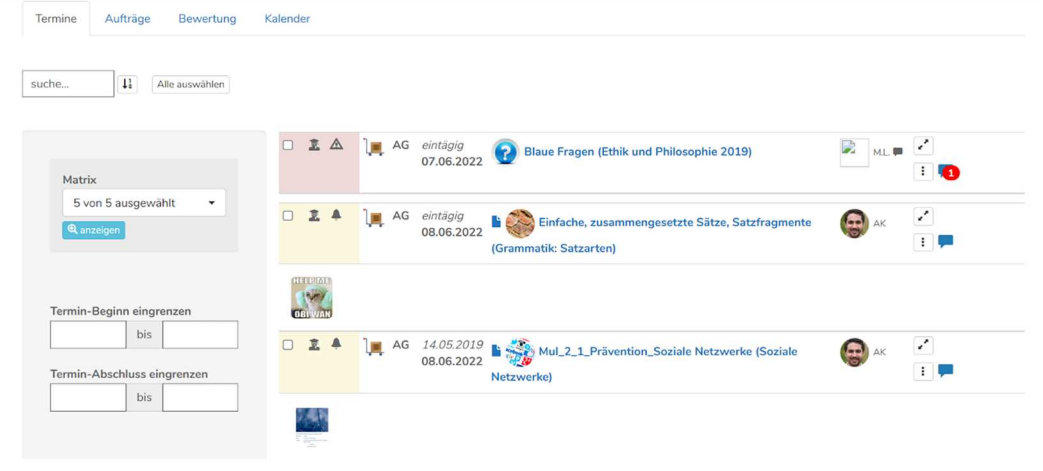

Figure 2. Screenshot of the student view of the Escola Learning World platform (researcher test account).

Noah's description is reminiscent of a panopticon: isolated from peer interaction, he is confronted with his tasks in the digital space, knowing that teachers can see at any time whether he has completed them. By governing students' planning through colour coding, the platform deeply intervenes in student time management, which is an important feature for student autonomy in personalized learning settings (Hangartner et al. 2023). Although he feels nudged by the platform, Noah understands that the teacher controls the platform and communicates with students via the platform. Therefore, if the platform incorrectly indicates a missed deadline when Noah has already completed the assignment, then he explains it away as the teacher's neglect.

Knowing that our critical interpretation does not align with the students' self-perception of their work with the platform is essential. In informal conversations, students unanimously praised the pedagogical model for allowing them to learn individually and at their own pace because the teachers adapt the deadlines to each student's tempo. Furthermore, the students stressed that they help each other rather than compete in the mixed-age learning groups, unlike in homogeneous classes. The students emphasized their mutual support and team spirit, although collaboration is not supported by either the platform or the spatial organization of the learning studio.

Platform-based efficiency by standardization and teacher care

The headteacher acknowledged the problem of students working in isolation in the learning studio during the interview. Therefore, he added, it is crucial to balance individualized settings with other teaching formats that are socially oriented and provide opportunities for exchange and collaboration. He further addressed the criticism levelled at personalized learning:

> There are always teachers who say that this individualization is inefficient because you explain the same task 20 times. That's partly true, but I don't explain it the same way 20 times. I ask questions quite differently; I give help quite differently. Because I know the students, I know where the problem is and how to intervene to keep this student moving forward. […] Thus, the kind of guidance and support is quite individual.

The headteacher suggests that an ethic of care motivates his guidance within personalized learning and that teachers take significant time to respond to students' individual problems to determine ways for them to proceed with their learning path.

Robert further explained that the complicated individualized organization is possible only through close collaboration between teachers who share teaching content and methods. The degree of shared and standardized teacher work at this school is unusual in Switzerland, where teachers still have substantial autonomy in their choice of content and method. From the headteacher's perspective, standardizing tasks saves time, which can be reinvested in additional teacher presence in the learning studio, which explains the exceptionally good teacher-student ratio at the school.

In summary, this school strives for personalized learning by tailoring education to students' individual needs. This endeavour involves an ethic of care that responds to students' characteristics (Ruckenstein and Turunen 2019). This intensive individual guidance and support requires frequent platform-based monitoring and modulation (Deleuze 1992). However, the platform does not adapt learning goals to students' individual needs as the platform's services are limited to the automated assignment of tasks and deadlines to individual students as well as the monitoring of students' time management. The focus on personalized student guidance has a domino effect on teachers' working conditions: the potential efficiencies that the platform provides expand teachers' duties, create an additional classroom presence, and standardize their teaching.

Case study 2: personalization in a teacher-centred setting

Students in our second case study have five weekly lessons in which they work individually on established tasks. Philip, the teacher, closely monitors the students' planning to ensure that

everyone completes their work on time. At the beginning of the individual student work session that we observed, Philip asked the students to plan their work for the session and to document it in the learning journal. After a few minutes, Philip walked around the class, reviewing some learning journals and signing the entries. Students consulted the tasks and resources provided in *Microsoft* OneNote but completed worksheet assignments on paper with pencils.

Philip later explained that making students responsible for planning their work – within a guided setting – encourages their autonomy, and he adjusts the level of control by assigning different levels of autonomy. The students in the elementary category present their learning journals to Philip at the beginning and end of each session, whereas the advanced students do not have the same requirement; rather, they meet with him once a month to discuss their progress. Philip supports the students' self-direction by teaching learning strategies and meeting regularly with individual students to reflect on the feasibility of their planning and working behaviour. Depending on their demonstrated degree of self-direction, students either advance to increased freedom or decrease their autonomy in favour of more intensive support. In this class, personalized learning is integrated into classroom teaching, and students must complete any unfinished work at home so that learning levels are maintained across the class.

OneNote Class Notebook as material storage

Philip's teacher-centred and whole-class approach to students' self-directed work is reflected in his use of the platform and associated digital devices. The OneNote Class Notebook application on the *Microsoft Teams* platform is a crucial tool through which Philip distributes materials to students, including self-created *PowerPoint* presentations, book extracts, copies from textbooks, and other analogue sources. Additionally, Philip projects OneNote onto a canvas as an impromptu digital whiteboard. During our visit, we observed that Philip initially intended to work on the blackboard but then switched to the digital instrument to demonstrate his digital approach. Figure 3 illustrates that this digital whiteboard duplicates the traditional blackboard to hold students' attention.

Figure 3. OneNote Class Notebook projected onto a canvas, which was used as an improvised digital whiteboard.

The teacher referred to using the digital whiteboard and offering the material digitally to students as *dual teaching*. Philip later explained that a benefit of working with OneNote is the ability to save notes written during lessons:

> If something is written on the blackboard, it's visible as long as I'm in the room. Eventually, I must erase it because I don't have unlimited space. This is not the case with digital teaching.

Philip stores the notes he writes during classroom interactions and provides them to students who are absent or who want to revisit the material. Furthermore, digital storage allows students from his colleague' class to access different perspectives on the same topic. Although Philip primarily works digitally, he hesitates to encourage his students to do the same. During the observed lessons, students worked mainly with paper worksheets. As he noted, practically speaking, there are not enough expensive digital pens for everyone, which is a barrier to students working digitally. Additionally, Philip also sees problems with students working primarily on their digital devices.

> I think they [the students] are not yet that comfortable with the laptop. The distraction is bigger. And they're closer to me when they're working with a piece of paper, and they're not just on a device. […] And I think the interplay between something completely digital and then dual [teaching] again and then again in a plenary setting with me – that is what makes a difference.

The quote suggests that, in addition to methodological diversity, it is vital to Philip that the students do not become distracted but remain focussed on the teacher. In line with this concern, Philip uses an application to control the students' laptop use. Consequently, Philip's 'dual teaching' approach reproduces a teacher-centred classroom organization in which the teacher controls and leads the class through digital means while maintaining students' in-class focus and assignment completion.

In contrast to the first case study, this platform-mediated setting is not related to close collaboration between teachers. Philip works closely with one colleague, sharing planning and material. However, teachers are primarily autonomous in content and teaching methods, and the platform is mandatory only for class communication.

At this school, self-directed task completion enables students to learn to assume responsibility for organizing their learning. Their self-directed work is continuously synchronized, which is supported by the class-based distribution of material through *Microsoft Teams* OneNote. The overall pedagogical framework is the disciplinary classroom, which is related to educating students to become autonomous citizens and a high degree of teacher autonomy.

Case study 3: sharing as a didactic strategy using Google Classroom

The third school we observed is known for its innovative and pedagogically sound digitalization strategy; it is widely referred to as *Google school* due to its use of Google Chromebooks and the Google educational platform. The school publishes its comprehensive ICT policy under an open access licence on its website. The policy states:

> Digitality is an integral part of our school's daily teaching and collaboration. An important goal is to guide students towards a self-determined digital identity.

This policy includes pedagogical ideas, technical conditions, as well as privacy and legal concerns while promoting digital identity, teamwork, and the pedagogical transformation of teaching. Teachers at this school share their teaching materials via the Google platform, where they are stored in subject-specific digital classrooms and can be accessed by teachers and students.

In an extended interview, Patrick, the ICT teacher, emphasized that digital transformation is an ongoing process:

> And they [the teachers] also noticed, ha, we can share the tasks digitally, and they don't have to be printed out at all. You can post it in the [Google] classroom and invite each other, and it's still my teaching material, and I can change it very quickly and just in time. […] If someone else takes it from me, it will be developed further,

> and it will certainly be better than my first idea. But I have to allow you to share your things online, and later, I can take the new version and adapt it.

Teachers collaboratively develop their teaching by sharing, copying, improving, and sharing again. Patrick, the school's catalyst of the digitally mediated pedagogical development, emphasized that the sharing strategy emerged from a group of teachers who desired to initiate digital school development, thus creating a certain 'pressure from within'. These practices did not develop immediately; as he stated, 'It took some time for some teachers to overcome their fear of engaging with the platform'.

Autonomous participation in the digital society: developing, collaborating, and experimenting

As we entered the classroom, we noted that the room's layout and furniture arrangement seemed to correspond to a traditional classroom concept, with students sitting in rows facing the blackboard at the front. However, we soon noticed that the traditional teacher's desk was replaced by a standing desk, where the teacher frequently interacted with students. Furthermore, the student desks were movable, and students rearranged their desks to change from individual to group work or vice versa (Figure 4).

In this classroom, we observed the following usage of the platform:

> Students in geography class were tasked with planning a weekend trip to a European capital for a given client profile. The assignment description and the assessment criteria were posted on Google Classroom, and students were given four lessons to complete the project. Students worked in pairs on their Chromebooks, searching the internet for information and editing the same document. At the end of the unit, the groups presented their planned weekend trips to the class.

Figure 4. Classroom with mobile desks and chairs.

Simon, the geography teacher, stated that working in such open learning scenarios is widespread at the school and had been practised before the digital platform was implemented. He explained that the daily use of the platform had become integral to the students' school lives. In addition, Simon considered the internet a vital source of information, as it opens teaching and learning. The students

maintain a personal learning journal as a semi-public website on which they document what they have studied and share their projects. Both classmates and teachers can access these journals.

The teachers we met at this school were disappointed by the usual formats of personalized learning in which students complete worksheets with closely defined tasks. These teachers were eager to reduce learning taskification in favour of increased openness, autonomy, and student collaboration. Consequently, they were experimenting with project weeks during which students pursue their projects individually and collaboratively. The focus lies on the learning process; students decide their project topics, which enhances their motivation. The teachers mentioned as possible examples painting a picture in the style of a famous artist or accomplishing a free kick similar to a professional football player. Again, students reflect on their practice in their learning journal on the platform. Beyond these project weeks, the teachers considered allowing students to choose to work from home for a half-day each week, with teachers offering online support. These plans illustrate the teachers' visions of personalized learning by broadening the temporal – spatial organization, opening classroom boundaries, and fostering student participation, autonomy, and collaboration.

Digital participation, data protection, and control

The students' autonomous participation in the digital society, and therefore data protection, was a central concern for Patrick. He repeatedly referred to the framework agreement between the school authorities and Google, which meets the requirements of the Swiss Data Protection Act. In his classrooms, Patrick sensitizes students to data protection concerns and the implications and effects of sharing personal information online.

On request, Patrick shared his opinion regarding the difference between the *Google* and *Microsoft* platforms:

> Ok, I'll say this again. This is really important to me. My concern is not the product. It's not about one being better than the other. I think Google has a different business philosophy than *Microsoft* […]. *Microsoft's Office* Suite is more business-like; it comes out of the business world, and you can see and feel that a little bit. Google has evolved within the web. It has been digital and collaborative from the very beginning. *Microsoft* has retrofitted and built this into the products. If it's really about sharing and the web idea, and if that is extremely important, then I do pretty well with Google. I can do everything with *Microsoft*, but if I'm coming out of a managed thing – that's putting it very bluntly, that's important to me – if I'm working in a very structured, very managed way, and I want to fall back on what's already been done, then I'm probably better served in a *Microsoft* environment.

Patrick frequently stated that classroom practices do not depend on the commercial platform, but he also noted the different 'business philosophies' related to different cultures of digital practices: Google has a sharing culture, and *Microsoft* is shaped by management principles. Patrick and his colleagues emphasized sharing as an important part of their work ethic, which suits the Google platform environment. By using the Google platform, however, they ultimately serve the platforms' business and control model of exploiting user-generated data.

Conclusion

This exploratory study provides insights into platform-mediated approaches to personalized learning in Swiss schools. The case studies – as mundane as the involved practices are – point to a profound transformation of education by opening up the disciplinary classroom to a learning environment where students self-direct their learning. Rather than liberating students, personalized learning is emerging as a governing technology that places responsibility on students to actively manage their learning, supported by new forms of teacher guidance (Simons and Masschelein 2008). This transformation precedes but is exacerbated by the platformization of education, as datafication supports the individual monitoring of students' learning and their personalized support (van Dijck, Poell, and de Waal 2018).

However, reading the case studies as merely illustrative of a general shift in public education from class-based instruction to platform-based personalization neglects the ambiguities, frictions and contradictions inherent in the situated practices. In the schools portrayed, platform-based monitoring of students amalgamates with an ethic of care, disciplinary control, and emancipatory ideals of autonomy. These situated practices reveal teachers' agency in integrating platform features and adapting educational policies in ways that reflect their pedagogical values. Furthermore, the different platforms favour certain pedagogical practices that are more in line with a disciplinary or an environmental governing logic. Thereby, specific platform logics interact and intermingle with teachers' approaches of individualization, organizational routines, ideals of autonomy, and visions of good pedagogy. The entanglements of platforms in pedagogical practices, or the pedagogical 'doings with' platforms (Wagener-Böck et al. 2022), produce ambiguous approaches to personalized learning.

Notably, these teachers, eager to use platforms to promote personalized learning, did not rely on data-driven and algorithm-based analytics to tailor education to students' individual needs. Instead, they engaged platforms to support mundane organizational practices, such as the automated distribution of resources to students. Rather than interpreting this neglect as a lack of knowledge about technical opportunities, we suggest that it indicates teachers' reluctance to base their practice on data. We assume that teachers are careful to maintain control over their pedagogical practice while adopting new tools in ways that fit their needs.

By focussing on pedagogical practices, this exploratory study cannot capture the datafying effects of platforms – apart from the coarse observation that the transparency they provide amplifies the possibilities for controlling students and teachers. However, it points to the need to study platform effects in the context of situated practices while considering local conditions and human agency. A critical platform pedagogy is needed that explores, together with school actors, how platforms can support classroom practices that are not preoccupied with individualization but are committed to education as a public and convivial good (Facer and Selwyn 2021).

Notes

1. The approaches are often called *self-organized learning* or *individualized teaching* in Switzerland, but they are increasingly referred to as *personalized learning*. Given the conceptual inconsistencies and the heterogeneity of classroom practices that refer to these terms (Schmid et al. 2022), we retain *personalized learning* as an umbrella term.
2. The *Lehrplan 21* applies to the compulsory schools in the German-speaking cantons of Switzerland, see https://www.lehrplan21.ch/ (03 June 2024).
3. (https://www.educa.ch/de/news/2021/educanet2-und-edcuaid-sind-offline; (28 May 2024).
4. Two or three researchers did the school visits, and fieldwork in those schools discussed here consisted of the following interactions. Case study 1: observation of three lessons, a two-hour interview (in two parts) with the headteacher, a 30-min interview with the ICT teacher, and a 30-min interview with a student. Case study 2: observation of three lessons, a one-hour interview with the secondary/ICT teacher, and a one-hour online interview with two teachers of the primary level. Case Study 3: observation of four lessons, a two-hour interview (in two parts) with the ICT teacher, and a 30-min interview with a further secondary teacher. Further informal, shorter conversations were conducted in all schools. The interviews were transcribed, and the notes were processed into detailed descriptions. The material was deductively and inductively coded, and the insights were compared in joint meetings. School websites and available documents, such as school digital policies, were included in the analysis.
5. The headteacher and teachers cited in the text received the draft article and granted permission to include the photos. We translated all quotes from Swiss German to English.
6. See https://www.escola.ch/ (27 May 2024).

Acknowledgments

We thank the anonymous reviewers and the editor for their feedback on an earlier version, which considerably helped to realign the analysis.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

The project (duration: 01 February 2022–30 September 2022) was supported by the BeLEARN project funding line 'digital transformation and digitality' (https://belearn.swiss/projekte-belearn/). The project was embedded in an extensive study on the governmentality of autonomy-oriented learning settings, which was funded by the SNSF (2017-2022; [grant number 100019_173035]).

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