The imaginary of personalization in relation to platforms and teacher agency in Denmark

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ABSTRACT
In this theoretical paper, we argue that Tech enthusiasts and skeptics are animated by the same sociotechnical personalization imaginary to improve education and teaching through personalization, but see very different paths to this goal. Tech boosters point to well-known problems of the existing education system — and rhetorically ask: ‘why shouldn’t we solve these problems with technology?’ Doomsters claim that only humans can do this and ask ‘why should we relinquish power to machines?’ We believe that the full implications of incorporating adaptive technologies in schools have neither been considered, fully revealed, or adequately prepared for by either side. But we are not interested in evaluating either the claims of techboosters or doomsters. Through an analysis through the lens of imaginaries, we reveal the false dichotomy of for or against technology, which obfuscates the fundamental question of whether the social technology we have put in place to educate ourselves solves the right problem and solves the problem well? We conclude with a brief discussion on the value of the personalization imaginary. We argue that the question is not whether platforms enable or disable teacher agency per se, but rather why should we hold up personalization as an ideal for education?

Introduction
The Danish public sector is one of the most thoroughly digitized in the world, taking fourth place in the latest Digital Government Index by the OECD (Ubaldi et al., 2020). The Danish education sector, particularly K-12, is no exception. A recent study reveals that 90% of the teachers use digital learning resources and educational technology weekly or more in their teaching (BUVM, 2021). Concomitantly, schools have for some time now been targeted as a booming market for EdTech companies gaining increasing interest from venture capitalists. New start-ups are plentiful, while existing publishers seek to develop their portfolios. As EdTech platforms become presumably more advanced and increasingly adopted as part of the infrastructure of schools, they also become actors that (re-)enact particular ideas of the key concepts that constitute the semantics of school such as ‘home work’, ‘subjects’, ‘classroom’, ‘learning’, ‘pupil’, ‘teacher’ etc. (Selwyn, 2016). The core argument for a particular subset of EdTech companies and investments is the attainment of so-called ‘Personalized learning’ (PL; FitzGerald et al., 2018). These are platforms that seek to take advantage of new developments in machine learning and artificial intelligence found elsewhere in the digital market (such as recommender systems known from streaming services). The idea of personalized learning has been promoted by influential actors such as OECD (OECD, 2019, p. 12), Gates & Melinda Foundation (Pane et al., 2015) and Mark Zuckerberg (Zuckerberg, 2017). The main idea is that the systems employ algorithms that adapt content to student’s individual needs. They purport to be highly customizable, sensitive to their users levels of proficiency, learning styles and similar, all in order to provide every student a personalized learning path. As such, ‘Personalized learning’ echoes a well-known pedagogical ambition of achieving a teacher–student ratio of 1:1 (Bloom, 1984) and should not be cause for controversy in educational communities? This is not the case. The amalgamation of platformization (Cone, 2021; Cone & Moos, n.d.) and adaptability, does in fact reiterate old educational ideals of personalization and dresses them in new cut cloth. However, personalizing and adaptive technologies are not simply content providers. They also employ algorithms that make decisions about when and how the learner should be exposed to content – decisions that are normally the sole province of teachers – in order to systematically maximize the learning experience, its efficiency and outcome. All of this without teacher intervention. As Selwyn puts it: ‘It is claimed that AI technologies are now capable of supporting superior forms of education that do not entail the central involvement of a human teacher’ (Selwyn, 2019, p. 3). So, while educators broadly subscribe to personalization as an ideal, they see the work and...
processes that go into personalization as a uniquely human endeavour and therefore as an inseparable property of teacher agency. From this position, learning platforms can never truly personalize. Such technologies therefore provoke sharp resistance from educators. In the following, we unfold these diametrically opposed positions. But we also explore the deeper framework of imaginaries to explain how they aim for the same goal, but differ markedly on ideas on how to reach that goal. We argue that both EdTech companies and educators are animated by the same sociotechnical personalization imaginary to improve education and teaching through personalization, but see very different paths to this goal.

In this article, we draw on two cases that exemplify what Bigum and Kenway have labelled doomster and boosters (2005). ‘Doomster’ is the position from which technology causes a social and educational decline: ‘The scenarios that doomsters describe, tell of societies over-run with technology in which human interaction, sense of community and the ability to deal with issues at other than the superficial level offered by electronic media is much diminished’ (Bigum & Kenway, 2005, p. 13). The boosters, contrarily, see technology as solutions to problems in schools: ‘To boosters, the duty of teachers is to make best use of these technologies as they become available as if they all have intrinsic educational value’ (Bigum & Kenway, 2005, p. 5).

Boosters point to well-known problems of the existing education system – and rhetorically ask: ‘why shouldn’t we try to solve these problems with technology?’ Doomsters claim that only humans can do this and ask ‘why should we relinquish power to machines?’ Both claims are presented in terms of teacher agency. Digital platforms claim to both enable and empower teachers, by augmenting their cognitive resources and freeing up time from rote learning. Doomsters see such platforms encroaching on teachers territory in the process limiting their elbow room and crippling teacher autonomy.

In the following section, we outline what is meant by the concept of a sociotechnical personalization imaginary, before we continue on to analyse the imaginary at work in relation to teacher agency, platforms, and adaptivity. To argue our case, we critically analyse two publicly debated perspectives from Denmark. The first comes from a major Danish EdTech company, Area9 Lyceum, that has argued in public discussions that new, adaptive technologies complements, bolster and even augments teacher agency. The second is a public debate held in the Danish parliament about the future of platforms and digital technologies in Danish primary schools. Finally, we discuss how their disagreement not only locks them into a stale discussion of pro or con technology but obscures the more important discussion of why personalization should be an educational ideal?

Theory: sociotechnical imaginaries

In research on educational technology, the concept of sociotechnical imaginaries has proven useful in analysing the ideas, beliefs and desires that give directions to actions, particularly as theory for policy analysis (Matthews, 2021; Rensfeldt & Player-Koro, 2020; Tafdrup, 2020). Derived from Sartre’s work on imagination (Sartre, 2004) imaginaries can be defined as ‘collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology’ (Jasanoff, 2015, p. 6). This shared repertoire of images that simultaneously evoke visions, values and meanings effectively institutes the imaginary as one of regulation and norm (Castorriadis, 2007) that encodes ‘visions of what is attainable through science and technology, [as well as] how life ought or ought not, to be lived’ (Jasanoff, 2015, p. 6). The imaginary is repeated and reproduced while often crystallized into symbols or slogans (Williamson, 2015, p. 144). Imaginaries are the lenses through which we experience the world, other people and ourselves (Lennon, 2015, p. 1). For the present purpose, the concept of imaginaries is a tool that allows us to see how new technological constraints are rejected, adopted or co-opted according to how well they reproduce an existing imaginary.

The introduction of new technology into an existing context is often conceptualized as an incursion, i.e. ‘the technology’ is imagined prior and separate from the context it is subsequently introduced into. From an actor’s perspective, ‘meeting new technology’ appears as an isolated conscious decision of whether ‘to adopt or not’. Such accounts are at risk of implying a type of technological determinism (MacKenzie, 1996), where technology is perceived as something that can be defined independently (Bruce, 1996) and co ipso cause changes in behaviour, events or society as a whole. But technology adoption should rather be seen as a process of gauging how well the ‘new’ technology co-inhabits the ecology of existing technologies. When technology is seen through the lens of ‘imaginaries’ (Friesen, 2020; Griffin, 2002; Jasanoff, 2015; Steger & James, 2013; Williamson, 2015), new technology only becomes meaningful and important relative to how they repeat, reimagine or transform the patterns of the existing technological set-up.

This perspective allows us to re-evaluate technology narratives that reiterate well-worn tropes of society’s decline or ascendency. Boosters will describe
the past ‘in terms of its failings, brokenness and incompletion [viz-a-viz], the future … characterized by its totality, completion and finality’ (Friesen, 2020). Sceptics will paint a picture of a bleak future where ‘machines are replacing human beings, and online environments are gathering our data and using it to manipulate us’ (Davidow & Malone, 2020, backcover). By juxtaposing a ‘before’ and an ‘after’ both narratives impute technology as the causal agent. There are real and relevant considerations as to how changed technological constraints affect spaces of possibilities; however, in terms of explaining why and how technologies are ultimately adopted or rejected, these narratives serve as little more than rallying cries for boosters and doomsters alike. Debating for or against a given technology, or technology as such, serves as a form of misdirection that suggests that arguments decide the fate of a technology.

Seeing through the lens of imaginaries allows us to forego the for or against and see them as competing alternatives whose fate are decided by entirely different mechanisms than those of a debate. Although buying into a narrative supports the flow of investments and in a social constructionist way ‘constitute’ the imaginary through shifting coalitions, the real work of communal adoption of an imaginary and a technology is one of ‘voting with your feet’. The technology has to transition, to be integrated into workflows, supply chains have to be rerouted, users and technicians have to be trained, etc. (Valverde, 2016). In other words, there is to be weighty reasons for switching to a different constellation of technology, i.e. ‘proof’ that the incoming technology represents a better way of ‘doing things’. When a switch does occur, users and decision makers have decided that this is the case. If this occurs on a global scale there is a shift in what Carlota Perez calls the techno-economic paradigm, which she defines as a best-practice model made up of a set of all-pervasive generic technological and organizational principles, which represent the most effective way of applying a particular technological revolution and of using it for modernizing and rejuvenating the whole of the economy. (Perez, 2002, p. 15)

In other words, the issue for someone deciding on whether to adopt or not, is not so much for or against technology, but between which side can deliver on the imaginary? When arguments are put forward both sides concretize a bid on how the desirable future of the imaginary can manifest itself. Proponents of new technology cannot simply dictate an imaginary. They have to convince the agents of the context that ‘this is what your dreams look like’ and provide criteria that, if met, satisfies the user that the dream has been delivered, i.e. it has to be operationalizable as practices (Williamson, 2015). They do so while in competition with other narratives and technological hopefuls in a manner much less orderly than imagined by the modernistic stories of technological development and revolutions (Edgerton, 2008; Geels, 2005; Williamson, 2015).

Underneath the two positions, which we sketch out below, a common goal, desire or more specifically, an imaginary, is traceable. We name this the personalization imaginary.1 This imaginary comes in two disguises. One in which the teacher offers the essentially perfect learning experience for the learning subject in terms of personalizing the why, how and what of teaching. Another where the teacher is accompanied by an AI in the form of an adaptive technology. Both advocate the age-old imaginary at work in education of ‘personalized instruction’ (Friesen, 2020). The former, in a classic version of one-to-one dialogic teaching. The latter co-opts the same imaginary. Rather than build support from the ground up, it taps into patterns of an existing imaginary and presents itself as a much more cost-effective and promising alternative. Both employ language of empowerment. They paint the image of a teacher with a strong agency, in a position to determine and select proper actions in the classroom. Below we discuss and analyse how narratives are built around platforms and personalization and their influence on teacher agency through two positions.

**Method**

In the following analysis, we draw on two different instances of framing the relation between digital or adaptive platforms, teacher agency and personalization. Though not being a strict case study, our selection is driven by what Bent Flyvbjerg denotes maximum variation cases. These are cases that allow one to ‘obtain information about the significance of various circumstances for case process and outcome’ (Flyvbjerg, 2006, s. 232). As such, maximum variation cases are not chosen for representativeness, but rather they serve to demonstrate and analyse the grey area breadth and depth of positions on a particular educational matter.

The first position represents the booster perspective and comes from a Danish EdTech company, named Area9 Lyceum, that has specialized in adaptive learning technology. The second, representing doomsters, is found in a debate held in the Danish parliament about future digitization in Danish education and school. Thus, the two examples differ in nature, one exemplified by the narrative of a company, the other derived from a debate. However, both focus on the relation between platforms and teacher agency. The empirical data for analysis and discussion on Area9 are constituted by their publicly available and self-published documents on their
pedagogical approach, as well as entries in public debates and discussions, where they defend and explain their stance. The empirical data from the second position come from the transcription of a debate held in the Danish parliament. The excerpts used in the analysis are chosen for their clarity in demonstrating the two positions. Along with the excerpts, we draw on relevant literature on adaptive learning platforms to validate, extend and elaborate on the claims values that characterize both positions.

**Analysis: framing adaptive platforms differently within the same imaginary**

In the following, we elaborate on the context of each position as we analyse how they tap into the personalization imaginary.

Position one: Platforms as enablers of teacher agency and personalization

The Danish EdTech company Area9 Lyceum epitomizes with their product Rhapsode, the contemporary narrative surrounding adaptive learning technology in Denmark. Starting as a product for use in the health care sector in 1997, it has since developed into a platform used widely by publishers in both corporate and educational settings. The company has primarily focused on Anglo-American use contexts, but has since 2018 moved into the Danish education sector as well. In 2018 Area9 received a historical grant of 30 million US dollars from the Danish Growth Fund, which grabbed the attention of both politicians, EdTechs, researchers and educators in debates on public media platforms, such as folkeskolen.dk and altinget.dk.²

As mentioned above, Area9 co-opts the personalization imaginary. Within cognitive research on learning, it is a well-established claim that the closer learning gets to a 1:1-ratio between teacher and student, the better the learning outcomes become (Bloom, 1984). As Selwyn puts it: "Technologists are fond of recalling the "2 Sigma" phenomenon reported by Benjamin Bloom, which reportedly found that students learning from one-to-one tutorials performed at considerably higher levels than those receiving conventional classroom instruction" (Selwyn, 2019, s. 11). Although Bloom’s findings have been forcefully disputed (VanLehn, 2011), the idea is still very much alive (Cf., Brown, 2012; Dodds & Fletcher, 2004; Forsyth et al., 2016; Friesen, 2020; Koedinger et al., 1997; Natriello, 2017; Oxman & Wong, 2014). Area9 refers directly to Bloom’s 2-sigma problem when explaining their approach to learning, and states:

Our adaptive learning approaches this one-to-one interaction, ensuring learning happens more quickly, more deeply, and more securely. Digital delivery allows us to do this at scale and at low cost. (Area9, 2018a, s. 6)

The more the teacher is capable of personalizing learning, the better. The argument is two-pronged. The adaptive technology provides hither-to hidden insights on how to personalize and it frees up valuable time to focus on complex tasks. The technology involves mapping all relevant factors, e.g. proficiency level, preferred learning styles, socio-emotional state, time of the day and other factors that may impact the learning subjects susceptibility for learning. These are then coupled with an adaptive engine that makes decisions of which content to present to the learner, their sequence and modality. The argument also provides the ammunition for critiquing the status quo. The traditional organization of classes into 20–30 pupils, is – from a learning perspective – an inadequate compromise. Since the main reason that the ratio could never be 1:1 was economical, it is easy to see that a technological solution that scales at nearly zero marginal cost is attractive. The imaginary of the personalization in this version is thus driven by a desire to enhance the efficiency of education.

Adaptive technologies, such as those developed by Area9, are presented as tools that adapt in four ways that correspond with the good teacher:

- Adaptive technologies seek to provide **equal opportunities** and fulfill student needs through hyperpersonalization (McRae, 2013). A complete mapping of student data creates complete transparency of the learner and her situation.
- Semi-autonomous adaptive systems make low-level decisions that mimic (and relieve) the **expert teacher**. Intelligent tutoring systems engage students on recurring issues. Expert systems and early warning systems help assess skill levels and levels of engagement. Machine learning helps grade papers, check spelling, grammar and plagiarism. Recommendation systems help with didactic choices and order of subjects.
- **Platform solutions bring efficiency** and economies of scale. They relieve the teacher, whose hands now are free to focus on more pertinent matters.
- Finally, these systems solve the one hitherto unsolvable problem of fulfilling all students' needs 1:1, i.e. the 2-Sigma problem or as it is known colloquially: lack of funding. These systems are privately funded such that the noble pursuits of education and profitability go hand in hand (Williamson, 2014).

The ‘good’ adaptive learning system coincides with the ‘good’ teacher by virtue of being adaptive. Unsurprisingly, most proponents of adaptive technology go to great lengths to ensure that the perceived
ultimate aim of the technology is not to replace or limit teacher agency, but to empower the teacher. So, a host of benefits of adaptive technology are put forward. Forsyth writes:

Classroom instructors continuously seek ways to provide a more student-centered approach to meet student needs. Adaptive Learning promises to meet this need as it improves student retention, achieves better outcomes, and provides a more precise measure of student learning. (2016, p. 80) (see, also Pearson, 2016; Tyton Partners, 2012)

The main argument is, as mentioned, that using adaptive technology is efficient and frees up teacher resources that can be used for complex tasks that require higher-order cognitive processes rather than menial tasks (FitzGerald et al., 2018; Oxman & Wong, 2014). Area9 echoes exactly this stance:

If we didn’t have limited resources in our system, the optimal would be one teacher per student. But no one can afford that. So instead with our system we attempt to make the basic knowledge acquisition as efficient as possible, so the time the teacher has with the students can be spent on more complex learning. (Folkeskolen, 2018 n.p.)

As the first argument relies on a clear division of labour in terms of what kinds of learning each is responsible for, the argument segues directly into the second argument. The platform is imagined to enable and empower the teacher by complementing, cooperating and collaborating with her. As part of the cognitive infrastructure, the platform allows the teacher to off-load menial cognitive tasks and further enhances her agency indirectly by augmenting her cognitive capacity by providing an overview with custom-made insights to pertinent learning issues. While the platform gathers data on each student’s performance, the algorithm turns data into insights on students proficiency and engagement. The platform thus enables the teacher to strategically tailor her teaching and didactics. The educator dashboard on student performance is described as ‘the way for educators to manage students – all learning in personalized ways’ (Area9, 2018b, s. 5). The argument relies heavily on algorithms actually being capable of making such advanced calls in order for the system to drive or inform decision-making. The software is intended to prepare the teacher for the most optimal instructional decisions or even in some cases to make decisions in place of a teacher based on so-called actionable insights (Jørne & Gynther, 2018).

At this point, the arguments stay the same, but they are augmented by arguments of scale. It is not that the software does anything better than the teacher. It only does it faster and with millions of data points. The consummational benefits envisioned are known from algorithm-based recommendation systems used on commercial websites and social media (e.g. Amazon, Netflix and Facebook (Williamson, 2015, Zuboff, 2019)). These are imagined transposed into pedagogical contexts, rendering the teacher liberated with great agency to strategically target her/his teaching. The appeal to an economies of scale reveals the strong ties with the driver of Big Data: economy. EdTech companies attempt at carving a path for themselves is conditioned upon convincing stakeholders that their pursuit revitalizes or make possible long-standing ambitions in education of personalizing teaching through their algorithmic automation:

We have continuously had meetings with ministers of education and politicians on both sides of political spectrum to tell them: Don’t do anything stupid. But it is a tough one to swallow for some that we don’t need a teacher for everything. (Folkeskolen, 2018, n.p.)

Position two: Platforms as disabler of teacher agency and personalization

In March 2019, the Danish Ministry of Children and Education published the position paper titled ‘Digitization with consideration and foresight: Towards a new strategy of digitization of education’. The initiative was taken by the now former minister, and was a reaction to what is referred to as ‘the 00’s enthusiasm and astonishment of the digital revolution and the 10’s, in which we strengthened the digital infrastructure and created a market for digital learning resources and platforms’ (UVM, 2019, p. 4). As it is stated in the foreword, the time was ready for a new strategy: ‘we shall keep our enthusiasm, but also be critical’ (UVM, 2019, p. 2 emphasis added). The paper covers selected research and reports through four different themes: technology in teaching, as a subject, technology and the good childhood and technology in school. Each theme is treated fairly critically and questions are raised about the purpose of technology in education. Although the position paper was framed as a stepping stone to a new strategy, no such initiative was taken, most likely due to the election of a new government on the 5th of June, 2019. Thus, In December 2019, a debate was held in the Danish parliament to decide, what the next steps of the strategy should be (Folkeøinet, 2019). In this article, this debate constitutes the main empirical data for this position. The debate lasted two and half hours with participation of 11 spokespersons and politicians, among which the minister of Education. Various political perspectives on the relationship between technology and education are represented, and particularly the use of platforms in teaching was discussed.
Whereas the cognitive argument in the first position takes its point of departure in research, the political argument looks to ideas about the purpose of school and normative answers to the question of what ‘good teaching’ consists of. In the paper ‘Digitization with consideration and foresight’, the Danish minister of education, puts forward the imaginary of personalization as the image of a sovereign teacher, who is able to ensure good teaching for all students with attention to their individual needs and traits. Digital technology is here seen as an obstacle and disabler to realizing this agency:

The problem arises, when digitization ends up dictating the what and how of approaching the core task, namely securing good teaching for everyone with focus on how everyone learns and thrives as best as possible. (Folketinget, 2019 n.p.)

This argument relies on specific ideas on what ‘good teaching’ is and how it comes about. It furthermore assumes that personalization is part and parcel of being a good teacher. Like Socrates, good teachers wander the agora as guardians of equality that level the playing field for underachievers and wunderkinds alike.

Position one represents a commercial interpretation of how platforms allow for personalization and potentially empower teacher agency. The second position views the increasing presence of digital platforms as a pedagogical straitjacket for teachers in a political counter-perspective. As the Minister puts it:

The continued rise of favour digitization has in recent years, in some places, been a contributing cause of teachers being put in a straitjacket in terms of how they organize their teaching. And, on some of the schools’ learning platforms and digital learning resources, it has become unjustifiably consequential for the way teachers organize their classes. (Folketinget, 2019 n.p.)

Instead of augmenting teacher agency the digital learning technologies are seen as inherently weakening and limiting their agency. Technology embodies and entails didactical decisions and leaves the teacher with a decreased space of manoeuvring in the teaching and preparation thereof. With this view of technology, the Minister further elaborates:

Digitization is a tool. We should consider it just like the pen I carry in my hand. It is determining my ability to write, but it should not dictate what words I write. (Folketinget, 2019 n.p.)

In the negotiation of the distribution of agency to platforms and teachers, the Minister here assumes that technologies are capable of obtaining a strong degree of agency, to such an extent that it not only compels a particular behaviour from teacher, but it may eventually also force them to teach along its logic, and thus ‘dictate the words, they write’. This implies a rather deterministic idea; that a particular technology – in and by itself – forcing a particular agenda through, is able to diminish the agency of the teacher. It is assumed that the more intelligent and digital the technology becomes, the more agentic it also becomes

Once you have entered the track of digital platforms, there are in reality very few choices to make about what resources you want to use. (Folketinget, 2019 n.p.)

To surrender parts of this vital agency of the teacher to the digital platforms, conflicts with the image of the personalizing teacher who is responsible for ensuring that the teaching – and the resources used – are aligned with and targeted both the group of pupils in front of her/him with the broader aim of the school i mind, namely Bildung:

Since we have fast-tracked digitization in schools, we have also imposed on the freedom of the teachers to choose their own materials and organise subject content matters, in ways that suit their particular group of students, and aligns with the Bildung-task, the teachers have. (Folketinget, 2019 n.p.)

There is an implicit logic at play that assumes that the more digital platforms enter school, the less agentic the teacher becomes. Digital platforms disable teacher agency. Case one clearly claims the opposite. Technology is assumed to be the agent that frees up the teachers’ time to focus on the individual pupil or a groups’ need and attend to the Bildung-task, referred to by the Minister. In the perspective of the Minister, the issue boils down to a matter of ideology. The power of the technology and digital platforms, is at the end of the debate compared with the logic of totalitarian regimes:

From my point of view, we are touching on what’s the difference between totalitarian regimes, where it is decided what they should teach, and democratic regimes, where it isn’t. (Folketinget, 2019 n.p.)

Discussion

There are plenty of both concrete and more abstract reasons for current educational systems to be critical of the trend of personalized learning (e.g. Guzmán-Valenzuela et al., 2021; Watters, 2014). History shows that pedagogical trends depending on technology often promise more than they can keep (Cuban, 1986; Watters, 2014) and that it is, to a large extent, the lure of potential benefits rather than concrete evidence and experience that drives investment and implementation (Balslev, 2020; Perez, 2002; Sahlin & Wedlin, 2008). New technology goes through hype cycles where ideas gain momentum not ‘because they are powerful, but rather [because] ideas [become] powerful as they circulate’ (Sahlin & Wedlin, 2008,
p. 221]. As such adaptive technologies can be viewed as co-opting existing imaginaries for their own benefit. However, if the ultimate educational dream is one-on-one tutoring, and the derived problem of bringing down the teacher–student ratio is economical, then traditionalists’ argument that adaptive technologies provide disingenuous one-on-one instruction has to apply equally to the traditional classroom of 1:27? If the process of adjustment for the brick-and-mortar school is a play for efficiency, equal access to expertise and opportunity in a cost-effective manner, then traditional school systems have not made much progress when success can boil down to the luck of the draw of which teacher is available? Keefe muses that even the personal tutor 1:1 can fail

Personalized instruction might well trace itself to the days when Mark Hopkins sat on one end of a log and his student James Garfield sat on the other. Surely no one can quarrel with that student/teacher ratio, but even tutoring can fall far short of personalization if the teacher is not aware of the student’s previous knowledge and interests, cannot sufficiently relate to the student, or lacks sufficient pedagogical skills to help the student. (Keefe, 2007, p. 218)

Adaptive systems, considered as ‘new’ technology, purport to challenge the guiding logic and organizational culture of the Danish primary school system and its teachers. The introduction of adaptive technology thus provides an opportunity to re-evaluate long-standing assumptions about the existing delivery model’s ability to establish such a relationship. We believe that the full implications of incorporating adaptive technologies in schools have neither been considered, fully revealed or adequately prepared for by systems developers and school organizations alike. But, as we asserted in the ‘Introduction’ section, we are not interested in evaluating either the claims of boosters or doomsters. What we are attempting to shine a light on is that both ‘sides’ stake their claim in the same positive version of an tech-educational imaginary, while accusing the ‘other’ side of perverting the dream. Boosters enamoured by the new technology point to well-known problems of the existing education system – and rhetorically ask: ‘why shouldn’t we try to solve these problems?’ Doomsters wary of (new) technology extrapolate from tendencies found in the dark underbelly of that same imaginary – and claim that only humans can do this – ‘why should we relinquish power to machines?’ For example, McRae (2013) unfolds the doomster position and decries reductionist thinking in adaptive systems that privilege a single curricular area; he states that teaching machines do not build resilience in children and that students are at risk of entering echo chambers of content. Halverson and Shapiro (2012) counters by speaking of how students currently are inducted into ‘routines of disciplinary-focused learning through pedagogies of repetition’ (Halverson & Shapiro, 2012, p. 4). They see cultures of accountability obsessed with testing students and ‘a conservative world view in which educators already know everything students need to master’ (ibid.). We believe there is merit in both critiques and as such we see little reason to engage in a discussion for or against.

But the truly interesting point is that the false dichotomy of for or against technology obfuscates the fundamental question of whether the social technology we have put in place to educate ourselves solves the right problem and solves the problem well. Sidestepping the dichotomy of pro or con technology allows us to consider the ideal of personalization as it is upheld in terms of teacher agency.

If technology, seen as an isolated entity with autonomous agency is pitched against human agency, then naturally we will repeat the above dichotomy. There is a different perspective available from which we accept that the ability for a teacher to personalize their teaching is not only a matter of individual competences but also a question of whether the contextual and structural conditions and resources allow for the teacher to personalize. In the research on ‘teacher agency’, attention is rightly drawn to the contextual nature of agency, addressing how efforts, ressource, contextual and structural forces conditions agency:

[T]his concept of agency highlights that actors always act by means of their environment rather than simply in their environment [so that] the achievement of agency will always result from the interplay of individual efforts, available resources and contextual and structural factors as they come together in particular and, in a sense, always unique situations. (Biesta & Tedder, 2007, p. 137)

Technologies, with their particular affordances and intentionalities, shape and mediate the opportunity space for teachers in and beyond the classroom and constitute one of the most prominent contextual resources that transforms teacher agency. As such learning platforms should not be viewed so much as a technological incursion, but as a change in the technological constraints that enables as well as limits teacher agency. The question for both perspectives becomes one of gauging whether the agency created in situ, solves the problem as it has been stated – and perhaps more importantly, is this the right problem to solve?

It seems reasonable to suggest that the concept of ‘Personalization’ arises from the de facto problem of not being able to provide personal tutoring as soon as the teacher–student ratio moves beyond 1:1 (Friesen, 2020). Personalization is not simply an educational ideal and an integral part of being a teacher. It is born
from a structural problem of ‘not enough hands’, as it were. As such personalization is more than a didactical problem and a normative stance, it is a practical problem. Given traditional (analogue) technological constraints of a classroom, and 1:24 ratio, the teachers’ skills in classroom management, differentiation and keeping the class on track become highly visible. Being able to personalize speaks of a teacher’s level of expertise and experience. ‘Good’ is a measure of expertise. Ultimately, the extent to which a teacher adapts is evidence of the professional quality of her work.

Adaptive learning has always been a feature of good teaching. Whether it is the ability of a teacher to structure an in–class discussion to reveal conceptual misunderstandings, to guide stronger students to different readings than weaker students, or to create a flash–assessment to reinforce a learning point or punctuate progression, teachers – good teachers – analyse their own and their students’ performance. (Atkinson, 2015, p. 5, our emphasis)

Given a digital platform technology that seeks to distribute both the teacher’s attention, differentiation efforts and pacing, the teacher’s task of making trade-offs between competing interests steadily diminishes. At the end of this process personalization becomes endemic to the system. No learning content will be presented to a learner that is not ready for it. At this point, we may ask: is this end point desirable, possible or even imaginable? And if it is desirable, why is it so? And if it is not desirable, then why should we strive after it now, when the conditions for its realization are poor?

Our analysis shows that even though doomsters and boosters on the surface level appear to represent opposite sides of the personalization debate they in fact share the same personalization imaginary. With Rhapsode, Area9 Lyceum taps into the personalization imaginary by attempting to enhance the efficiency of education via scaling at marginal cost. The intention of the software is to provide actionable insights in order for them to take the most optimal instructional decisions. In this way, the company attempts to create a narrative of revitalizing the ambitions in education of personalized learning via their product by promising enhanced teacher agency. Voices in the Danish parliament maintain the same vision of a desirable future in the form of an educational system based on personalization, but argue that the presence of digital platforms such as Rhapsode works as a pedagogical straitjacket for teachers and thus weaken teacher agency. Their path towards a personalized education system instead involves teachers who choose their own materials and organize subject content matters in ways that suit their particular group of students.

Despite these different routes, both sides share the same educational imaginary while accusing the other side of distorting or perverting this vision. We argue that we need to sidestep the discussion and instead reconsider the ideal of personalization. In our minds, learning platforms are not technological incursions but shifts in the complex of constraints that realize variants of teacher agency.

To address the profound questions of the value of the personalization imaginary, we have to move beyond the deterministic positions that sustain it. In reality, no two intersections between digital platforms, personalization and teacher agency are the same. Thus, the question is not whether platforms enable or disable teacher agency per se, but rather when, how and why personalization is desirable? Why should we hold up personalization as an ideal for education? Given the many advocates for the idea that learning is social in nature, would it not be prudent to investigate the conditions that created a demand for personalization? To investigate how technology affects these conditions, and by extension, if personalization is relevant in an era of distributed learning?

Notes

1. For the purpose of this article, there is no need for clear-cut definitions of these terms. We shall use the term personalization as a cover term for differentiation, individualization, adaption, etc. We believe this to be acceptable, since what is interesting is the relative position these terms are given in the narratives. Shemshack and Spector (2020) write of personalized systems that: ‘The goal is to have a learning system that can dynamically adapt itself based on a learner’s characteristics and needs to provide personalized learning. Human one-on-one tutors can do this, and now it is possible for digital systems to do so as well’ (Shemshack & Spector, 2020, p. 3).
2. See https://www.folkeskolen.dk/soeg?q=area9 and https://www.altinget.dk/soeg/area9 for entries in debates.
3. All titles and quotes from data have been translated from Danish by the authors.

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We confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed. We further confirm that the order of authors listed in the manuscript has been approved by all of us.

We confirm that we have given due consideration to the protection of intellectual property associated with this work and that there are no impediments to publication, including the timing of publication, with respect to intellectual property.
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