Journal of Childhood, Education & Society
Volume 5, Issue 2, 2024, 294-304
DOI: 10.37291/2717638X.202452394
ISSN: 2717-638X
Review Article

From IT to I-It: Digitalization, datafication, automation, and the teacher-student relationship

Pekka Mertala[1]

Abstract: This conceptual article theorises the tensioned interplay between digitalization, datafication and automation and subjectness in education by asking what intensifying datafication and automation means for teacher–student relationships and how we understand and approach education. Theoretically, the paper draws on Buber's ideas of the dialogical I–Thou and objectified I–It as the key forms of human relationships. The core argument is that increasing datafication and automation steers the teacher–student relationship towards an objectified I–It relationship instead of the dialogical I–Thou relationship, which Buber (and others such as Biesta, another main influencer of the present paper) saw as the ideal. Literature-informed examples of various forms of educational datafication and automation are provided to support and concretise the arguments.

Article History
Received: 06 February 2024
Accepted: 09 April 2024

Keywords
Automation; Datafication; Digitalization; Education; Relationality

Introduction

> The development and affordances of predictive analytics may impact how teachers and other educational actors think about and teach students and, more broadly, how society understands education. (Jarke and Magilchrist, 2021, p. 1)

The above citation neatly captures one of the most important educational questions of our era: what intensifying digitalization, datafication, and automation means for teacher–student relationships and the way we understand and approach education. The digitalization (of education) refers to two things: the use of digital resources in teaching and the digitalization of the content and goals of education (e.g., the inclusion of computing education in the curricula) (Mertala, 2020). Datafication, in turn, refers to the transformation of social action (e.g., learning) into (online) quantified data allowing for real-time tracking and predictive analysis (Mayer-Schonberger & Cuckier, 2013). Lastly, by automation, I mean the replacement of human labor with independently operating digital systems (Merriam-Webster, n.d.), one concrete example of which is automatic attendance monitoring (Selwyn, 2022).

These topics have been pondered by others as well. Selwyn et al. (2021) expressed their concern that the data-driven automation of education presumes the eradication of the subject, while Sefton-Green and Pangrazio (2022) have written about the death of the educative subject. The core argument in these writings has been that the logics of datafication and automation are at odds with the idea of subjectness— "the arrival of the 'I' in the world as subject of its own life, not as object of forces or desires from elsewhere" (Biesta, 2022, p. vii). As Selwyn et al. (2021) summarised:

> Actual subjects can behave in inconsistent, irrational or even resistant ways that threaten systems of control, management and governance. In contrast, the automated subject is 'perfectly self-identical'—therefore fitting neatly within the constraints of datafied predictability. (2021, n.p.)

This tension appears to be especially extreme in childhood education (preschool, primary school, and secondary school). O'Neill et al. pointed out that simply due to physical growth and development, "the child as an indeterminable figure refuses to be captured in ways desired by the biometric technicians and apparatuses" (2022, p. 8). Pierlejewski (2020), drawing on psychoanalytical theories, expands this view

[1] University of Jyväskylä, Faculty of Education and Psychology, Department of Teacher Education, Jyväskylä, Finland, e-mail: pekka.o.mertala@jyu.fi, ORCID: https://orcid.org/0000-0002-3835-0220

to children's ways of being, as she argues that under datafication the "chaotic id-driven child must be suppressed and replaced with measurable, ordered, predictable data" (Pierlejewski, 2020, p. 471).

In this article, I theorise the tensioned interplay between digitalization, datafication, automation, and subjectness in education. To complement the works cited above, I draw on the relational view of subjectness, especially Buber's ideas about philosophy of dialogue, which is commonly regarded as a fundamental source within relational theory (Aspelin, 2020).[2] In his seminal work *I and Thou* (1937), Buber established a taxonomy and typology to describe the kinds of relationships into which a human being can enter. The main ideas in Buber's thinking was that people relate to the world and to each other in two different ways. In the I–Thou relationship, subjects meet one another in their authentic existence, without any objectification of one another. In the I–It relationship, the other is objectified as a mental representation, created and sustained by the individual mind. As Karjalainen summarised, the I–It relationship is "characterized by objectification and categorization, such as classifying things and human beings based on advance information and previous experiences" (2021, p. 37).

Datafication and automation bring new perspectives to Buber's ideas, especially to the I–It relationship. Today, the representation of a student is no longer created and possessed (only) in the mind of an individual (here, the teacher), but also through and as data points that are (automatically) analysed and visualised via different (often interlinked) platforms. Through these processes a "data doppelganger" (Pierlejewski, 2020) is created from/for each student.

My argument is that increasing datafication and automation steers the teacher–student relationship towards an objectified I–It relationship instead of the dialogical I–Thou relationship, which Buber (e.g., 1967) (and others such as Biesta (e.g., 2016), another main influencer of the present paper) saw as the ideal. In the sections below, I will engage in dialogue between the works of Buber and Biesta, critical research on the digitalization, datafication, and automation of education, and material from edtech companies to provide a rich and contextualised account of the risks to relational subjectness that emerge in and through teacher–student relationships caused by the datafication and automation of education. To ensure the article appeals to a broad readership, it focuses on concrete cases involving software applications (e.g., ClassDojo, Eduten Playground, learning management systems) used at various stages of childhood education, including preschool and the early years of primary education.

I approach digitalization, datafication, and automation (in and of education) as being in a nested relationship with each other. The rapid development of digital technologies has enabled intensive data collection in schools, which has further provided the basis for automated practices such as personalised instruction based on predictive learning analytics. A similar nested relationship is present in the images of children/students: Put differently, I will show how the I–It dominant view of children already existed in the pre-datafication and -automation era of the digitalization of education.

I–Thou and I–It in Education

For Buber (1937), I–Thou was an achievable and perceivable relationship. Some Buber-inspired scholars, however, have approached the I–Thou relationship as an "ethical ideal for authentic life with others in the world" (Charme, 1977, p. 171) rather than as a realistic relationship. Additionally, the unique nature of the educational relationship and the educator's desire to influence the educatee challenge the emergence of I–Thou—a paradox whose existence Buber (1937) also explicitly addressed. As put by Aspelin:

> Inevitably, teaching has an instrumental function: one party has the task of influencing another party in order to achieve certain goals, by using certain means and certain content. This function, and the relational structure that is attached to it, implies an 'I–It' attitude. (2020, p. 7)

Thus, it is worthwhile to ask whether education is only possible as an objectified I–It relationship, to which my answer would be no. First, it needs to be acknowledged that the relationship between I–It and

[2] The present paper is by no means a definitive or in-depth account of Buber's educational philosophy. Those interested in looking more deeply at his thinking might find the works by Aspelin (2020) and Karjalainen (2021), alongside Buber's original publications, worth reading.

I–Thou is not necessarily binary. Perhaps the best way to exemplify the shortcomings of a binary view is to think about what would be an absolute form of I–It. One way to approach this question is to conceptualise an absolute I–It as dehumanization (Haslam, 2006), where other people are objectified by denying their humanness. The most extreme examples of dehumanization are the ways in which "Jews in the Holocaust, Bosnians in the Balkan wars, and Tutsis in Rwanda were dehumanized both during the violence by its perpetrators and beforehand through ideologies that likened the victims to vermin" (Haslam, 2006, p. 253). It is fair to argue that I–It relationships produced by digitalization, datafication, and automation are not comparable with the extreme human rights violations mentioned above. Even though there are rather strict predetermined objectives for what students should become, their humanness is not contested or challenged.

On the other hand, reducing students into data points hardly implies the presence of an I–Thou relationship either. To overcome this issue, I suggest that we imagine I–Thou and I–It as a continuum whose ends are marked by the absolute forms of the two relationships. Buber (1967) noted that while I–Thou is an achievable relationship, it is not a permanent stage but happens in fleeting moments (see also Aspelin, 2020; Karjalainen, 2021). As a result, the vast majority of our interactions with other people happen in the "gray area" in which there is always some It in Thou and vice versa.

Formal Education as Instruction and Pedagogy

When we discuss digitalization, datafication, and automation in and of education, it is important to consider what we understand by education. According to Biesta and Miedema (2002), education can be understood as instruction and pedagogy. The instructional view emphasises measurable and testable outcomes, knowledge, skills, and a transmissional approach to education (Biesta and Miedema, 2002), whereas pedagogy refers to the "idea of a special, affectively charged relationship between teacher and child" (Friesen, 2017, pp. 733–734) —a loving attitude from the adult, as pedagogue, directed toward the physical security and social, emotional, and educational wellbeing of the child as student (Hatt, 2005). Indeed, teachers working with students of various ages have argued that their main task is to educate the "whole child," that is, promote the holistic wellbeing of students, including their social, emotional, and physical needs (e.g., Biesta & Miedema, 2002; Lasky, 2005).

Instruction and pedagogy are not mutually exclusive. Instead, formal education typically aims to provide students with observable and measurable skills, competences, and traits, as well as more ambiguous qualities. In more recent work, Biesta (2020) distinguished three dimensions of education: qualification, socialization, and subjectification. Qualification refers to society's need to qualify children for future professions. Socialization, in turn, takes place when young people are introduced to an existing societal order (Biesta, 2020). While these two dimensions have important purposes, to respect students' individuality, they need to be complemented with subjectification, which is about "our freedom as human beings—how I exist as the subject of my own life, not as the object of what other people want from [and of] me" (Biesta, 2020, p. 93).

Figure 1 summarizes my interpretation of the relationship between Biesta's and Buber's ideas. Qualification and socialization are located closer to the I–It end, as they both rely heavily on predetermined objectives of what children should become. Subjectification, in contrast, is placed closer to the I–Thou end of the continuum, emphasizing students' freedom to be and become their unique selves.

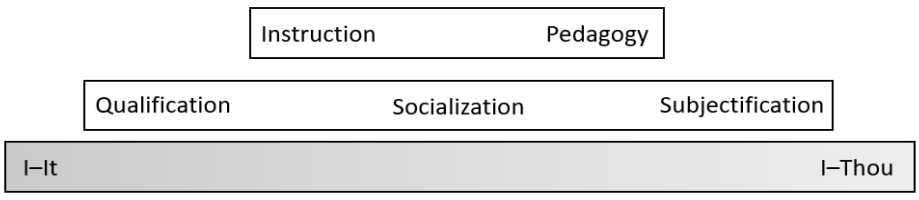

Figure 1. I–It and I–Thou as sliding scale

The relationship between pedagogy and instruction is not balanced, but the instructional view is the

dominant one in the contemporary educational sphere. At the level of educational praxis, education as instruction is present as tests, assessments, and rankings. Traditionally, tests were held periodically, for example at the end of a teaching term. The digitalization of education, however, has inserted the logic of testing into the realm of everyday schooling. One—perhaps the most—profound example is the use of learning analytics. Let us take ViLLE, a learning analytics platform used in roughly half of Finnish schools (Mertala, 2021) as an example. The designers state that the software "automatically recognises students' learning misconceptions in mathematics based on the information collected from their submissions" (Learning Analytics, 2019, n.p.). They also refer to a study which suggests that the algorithms of ViLLE predict learning misconceptions as effectively as a widely-used pen and paper test (Laakso et al., 2018). According to the website, the only difference is that "automatic analytics enables real-time viewing of information without a separate test" (Learning Analytics, 2019, n.p.). In other words, students are unconsciously taking a test every time they use the application

Different views on education also entail different understandings of what and who students are. In the instruction-oriented view, students are seen primarily as adults in the making whose education is largely determined by the needs of working life (qualification) and the existing norms and values of society (socialization). Both Buber (1968) and Biesta (2016) express their dissatisfaction with education which aims to train students to meet certain predefined standards by operating within specific set rules outlined by others. Biesta argues that education "isn't a mechanism and shouldn't be turned into one" (Biesta, 2016, p. 4); nor should it be seen in terms of a single "truth about what the child is and what the child must become" (Winter, 2011, p. 538). Buber, in turn, warns against education in which influencing the lives of others has become "a function and a law" (1968, p. 100). In the pedagogy-oriented view, students are primarily seen as unique subjects with no fixed and predetermined future (subjectification). In Buberian terms, the instructional teacher–student relationship can be approached as an I–It relationship, whereas the pedagogical teacher–student relationship resonates better with the I–Thou relationship. In the following sections, I present examples of the ways in which data-driven and automated educational practices are built on and work in favor of the I–It-oriented relationality.

The Image of The Child in the Digital Age

The distress about the eradication or slow death of subjectness is mainly seen as the result of datafication and automation of education (see Jarke & Magilchrist, 2021; Sefton-Green & Pangrazio, 2022; Selwyn et al., 2021). However, it is important to acknowledge that the roots of an objectified image of children lie deeper in the digitalization of education. Indeed, children and technology appear to be a combination that evokes rather spectacular and extreme imaginaries. Selwyn (2003) analysed how children and technology were represented in media and political discourses from 1980 to 2001 and identified six themes: 1) the "natural" child computer user; 2) the "successful" child computer user; 3) the "adult" child computer user; 4) the "dangerous" child computer user; 5) the "victimized" child computer user; and 6) the "needy" child computer user, each of which portrayed children in a decontextualized manner, regardless whether the tone was optimistic or pessimistic.

Had the data been collected a little later, the "natural child computer user" would have most likely been the dominant theme. In October 2001, Prensky published an opinion piece entitled "Digital natives, Digital Immigrants," in which he claimed that "our students today are all 'native speakers' of the digital language of computers, video games and the Internet" (2001, p. 1) because digital games, the Internet, and mobile phones had been an integral part of their lives since birth. While there were no data or research studies to back up these claims, Prensky's evocative article became a massive influencer for educational practice, policy, and research (Kirschner & De Bruyckere, 2017; Mertala et al., 2024). The fact that the term "digital native" comes up with more than 3 billion results in a Google search gives an idea of the ubiquity of the concept.

While the idea of children "being naturally adept user[s] of technology" (Selwyn, 2003, p. 355) dates back to the 1980s, Prensky's (2001) article can be seen as a catalyst for establishing the idea of a digital generation. Prensky, for example, argued that due to digitalization, "today's students think and process

information fundamentally differently from their predecessors" (2001, p. 1) and therefore called for a major reformation of formal education. Looking back, one major theme in pro-digitalization discourses has been that digitalization builds bridges between formal education and students' lifeworld outside the school: The use of digital technologies makes school more relatable for students and enables them to deploy their technological proficiency for learning curricular content (e.g., Yu & Couldry, 2022; Mertala, 2020).

On a superficial level, the logic would appear to promote I–Thou relationships as the content and methods of education are reformed to meet the needs of the new "digital generation." The problem, however, is that such a generation exists only in our imagination (see Kirschner and De Bruyckere, 2017 and Mertala et al., 2024 for a review of the lack of empirical evidence). To draw on Buber's concepts, a "digital native" (or any other reductive generational label) is an "It"—a categorised and objectified image of the other (see Karjalainen, 2021). As Buber (e.g., 1968) and Biesta (e.g., 2014) noted, such a starting point has undesirable consequences for education and teacher–student relationships—a view supported by research: Mertala (2020) studied digitalization processes in Finnish basic education and found that if the students did not fit the alleged image, their views and feedback regarding the digitalization of school practices were not taken seriously. Instead, students' critical reactions were deemed unintelligible or considered to be caused by unrealistically high expectations.

Paradoxical Promises of Personalization

The implicit message of the digital native myth is that all children are the same. The datafication and automation of education, however, appear to follow a different line of thought. The utility of datafication and automation is often backed up with promises of the personalization of teaching and learning, which revolutionises the traditional classroom where all students are taught the same content, in the same ways, at the same pace (Yu & Couldry ,2022; Watters, 2021): The more data we have about students, the more unique learning pathways we can carve out for them. Indeed, the proponents of learning analytics have argued that to be truly personalised and effective, learning analytics should be allowed to include personal information, including online behavior outside the learning management system (LMS), as "such data includes much potential for understanding and optimizing learning processes" (Ifenthaler & Schumacher, 2016, p. 933).

That said, the correspondence between the promises of personalization and the technical "reality" is far from optimal. Many of the technologies used in schools today draw on behavioristic theories, which are—metaphorically speaking—smoke-screened by their use of concepts that do not carry the undesired behaviorist legacy: instead of conditioning, we are just talking about guidance and nudging (see Watters, 2021). One example is an intelligent system: a computer program in which a scenario of how an individual should ideally interact with a learning task is modeled. After the task is completed, the individual's actual performance is compared to this so-called expert model, and the system locates those points where the individual's mental functions have deviated from the ideal. Based on the comparison, the system provides students with feedback that seeks to align their activities with the ideal model (Selwyn, 2019). Put differently, personalization, in such cases, means that there is variation in the pace and the order of the tasks, but—in the optimal situation—each route would lead to the same predefined outcome.

A similar logic is present in LMS, which predict students' performances. Jarke and Magilchrist described the functionalities of one such software, Brightspace Student Success System, by deploying quotations from the company's website:

> The 'simplified, interactive reports make risk patterns easier to see', and a 'success index' shows students' predicted grades […] Instructors can compare 'a struggling student's content usage, grades, and social engagement' 'at-a-glance' in order to 'find the cause faster', with 'interactive winloss charts' that show 'a student's position relative to course expectations'. (2021, p. 7)

As shown in the excerpt, there are explicit course expectations to which each student's performance is compared. If a student's LMS data indicate actual or potential risk (which the software promises to detect "as early as two weeks into a course (Jarke & Magilchrist, 2021, p. 7)), the teacher is alerted to take actions to get the student back on track—that is, to produce LMS data that indicate they are meeting the course

expectations.

Williamson's (2016) analyses of children's health apps used in schools offer one more relevant example of how digitalization, datafication, and automation work within the logics of predetermined objectives for (health and physical) education. As in an intelligent system, health apps are built around an ideal model of a child, as "these devices classify the child as normal or aberrant, and then generate pedagogic prompts that are intended to change their bodily behaviours to fit ideals about socially fit biocitizenship" (Williamson, 2016, p. 407).

As shown via the examples above, for a machine/software, the child is always It: a malleable object, which needs to be steered towards a predetermined goal. Therefore, the more datafied and automated education is, the more there is It in Thou, including in teacher-student relationships. The cogency of this argument is partly rooted in the history and present of the automation of work, which, throughout its history, has emphasised and increased standardisation, control, efficiency, and speed (Crawford, 2021). While the teacher-student relationship is hardly comparable with that between the employee and the factory/business owner, it would be naive to claim that socio-technological processes work completely differently in educational contexts. On the contrary, the use of digital technology appears to standardise both teachers' and students' work based on top-down predetermined objectives (Daliri-Ngametua et al., 2022), which reflects the global education policy trend emphasizing performance monitoring and accountability (Hardy & Lewis, 2017).

One concrete example of accountability is the way students' performance data are often used as a straightforward indicator of a teacher's performance. If the performance scores are low, the teacher is the one to blame (Daliri-Ngametua et al., 2022) and may even be dismissed if the grades do not meet expectations (O'Neil, 2016). Thus, teachers are compelled to "teach to the test" instead of "teaching for life," to use the old but representative expression about the steering force of standardised testing. The more the teachers are engaged in education as instruction, the less room remains for pedagogy and approaching the whole child—a topic discussed in more detail in the following sections.

A Machine-Readable Whole Child?

One could, of course, argue that there is no conflict between datafication and the whole child approach for at least two reasons. According to the first argument, students' emotional, social, and physical states and developmental traits can be captured and datafied as well. The rationale here is that data technologies are able to capture and "understand" complex phenomena such as health and emotions and thus provide a robust foundation for I–Thou relationships. IBM, for instance, promotes its Watson Element for Education app by stating that it "enables a new level of engagement for teachers by providing a holistic view of each student at their fingertips" (Yu & Couldry, 2022, p. 132).

A glance at contemporary schools suggests that evocative promises like the one cited above are taken seriously, as they appear to make intensive use of data: Covid-19 and periods of distance education have made learning analytics an integral part of education (Beerwinkle, 2021; Mertala, 2021). At the same time, the use of wearables, such as activity wristbands and sports watches, and smartphone-based health/exercise applications has become more and more frequent in physical education (Lupton, 2021), and modern school buildings are equipped with sensors that can capture and react to classrooms' carbon monoxide levels in order to provide students with the optimal conditions for studying (Mertala, 2021). Additionally, a wide range of technologies is used to identify, monitor, and shape students' behavior, emotions, and social skills (Andrejevic & Selwyn, 2020; Manolev et al., 2019).

The second argument is that automation of some educational processes and practices would allow teachers to put more resources into sensitive interaction with their students (Eynon, 2022) —a view well captured in the following extract from the edtech company Eduten's website:

> Eduten Playground's exercises are automatically assessed. Instead of never-ending pop quizzes spend more time on providing personal guidance and support to those of your students who need it right now. (EduTen, 2021, n.p.)

Put differently, the automation of instruction and/or routine work, such as the assessment of tasks,

would provide teachers with more time and opportunities to develop genuine relationships with their students. The logic behind this rationale is that some forms of I–It relationships are acceptable because they provide more opportunities for I–Thou relationships to occur.

While both lines of thought seem logical, they contain some severe problems. Let us begin with the datafication of the so-called soft skills. Biesta and Miedema (2002) identified that in an instructional-dominant zeitgeist, the pedagogical dimension of education also follows the logics of instruction. According to them, in such situations "the pedagogical task [is] […] conceived in terms of the transmission of specific norms and values and related knowledge and skills in order to bring about 'appropriate' behavior" (Biesta & Miedema, 2002, p. 177). In other words, in an instructional zeitgeist the pedagogical dimensions of education, for instance the teaching and learning of social skills, are standardised in a similar manner to academic subjects. Biesta and Miedema's (2002) words resonate with those of Manolev et al. (2019) in their analysis of the classroom behavior management software ClassDojo.[3]

According to Manolev et al. (2019), in ClassDojo, student behavior is displayed in the form of numerical data which function as a representation of the student. As a result, students become behavioral data points from which decisions can be made about the teaching and learning of social skills. It is highly questionable whether numerical data are capable of adequately representing the social, as they tend to obscure ambiguities and limit the explanatory possibilities necessary to adequately represent the complexities of social life (Selwyn, 2015). Behavioral data points tell us nothing about the contextual elements behind the behavior. Indeed, technologies such as ClassDojo have been criticised for approaching behavior as an individual psychological phenomenon (Manolev et al., 2019).[4] In such views, behavior and possible changes in it depend on the individual's own actions, and the application does not take into account that behavior and its evaluation are always phenomena produced in a certain context. Thus, as Manovel et al. (2019) put it:

> ClassDojo's numerical representation of students through behavioural data is a form of reductionism, dismantling the complexity of behaviour in order to facilitate the governance of students via classification, rankings, comparison and the like. (2019, p. 45)

The same reductionist logic is present in automated emotion recognition. Let us briefly examine the marketing material of the edtech company Viatech (2018), who claim on their website that classroom performance can be maximised through the use of facial recognition technology (FRT), because it

> ...can help teachers recognize different student emotions in class, measure their levels of interest, frustration, and comprehension, and use this information to adjust their styles accordingly. With FRT, teachers will be able to change their pace of instruction and tailor their classroom instruction to maximize students' involvement and performance. (2018, n.p.)

There are several issues with these assertions. Firstly, using facial expressions as indicators of emotions is unreliable. Additionally, FRT discriminates based on race, often interpreting faces of people of color as expressing more negative emotions compared to white individuals, marking them as more angry and contemptuous (Crawford, 2021). It's also crucial to recognize that children's faces undergo significant changes throughout their school years: the inherent flexibility and constant evolution of a child's face pose a challenge for its accurate modeling and algorithmic representation, making it especially hard to capture through algorithms (O'Neill et al., 2022). Second, even though the description of the software implies that it enables more sensitive education, it actually intensifies I–It relationships, as teachers relate to students based on the software analyses of the emotional landscape of the class. Put differently, if the software informs the teacher that students are feeling bored, she or he may relate to them as such regardless of whether the software has detected the emotional stage correctly or not.

---

[3] For those not familiar with ClassDojo, a brief description based on Manolev et al. (2019) is offered below. ClassDojo is a software that is compatible with most mobile devices and personal computers with online connectivity. Initially, teachers must create a class list in which each student is represented by a customizable ClassDojo monster avatar. Teachers then choose the behaviors and/or skills they wish to target and develop in students. Teachers can select from a range of default options, or they can customize their own. Once this is done, teachers can begin implementing ClassDojo at its most rudimentary level by rewarding students with points for desired behavior and penalizing them by taking points away. For visual information, see https://www.classdojo.com/

[4] It should be noted that the criticism that datafication and automation neglect the social and contextual dimensions of education is not restricted to behavioral datafication but, rather, seen as characteristic of all datafication and automation (Jarke & Magilchrist, 2021; Selwyn et al., 2021).

The second argument—that datafication and automation would save teachers' time for meaningful interactions with students—is contested by empirical research. There is a great deal of hidden human labor behind the automation of different services and practices (Crawford, 2021), and education is no exception. Research in Australia and the UK (e.g., Bradbury & Roberts-Holmes, 2017; Daliri-Ngametua et al., 2022) has shown that generating digital data in schools leads to an increase in human labor. This includes both officially recognized tasks and less noticeable work related to infrastructure maintenance and repair

Additionally, there is evidence that the automation of what are considered time-consuming routine tasks actually diminishes teachers' possibilities to create meaningful interactions with their students. One example of such practice is automated attendance screening/roll calling, which relies on AI-based facial recognition. To put it simply, students' faces are screened at the beginning of the class, and the teacher (and school administration) automatically receives a report of who is present or absent. It is estimated that lesson-based roll calls take two and a half hours per week, which equals over 93 hours per year[5]—more than a month's worth of the "learning time" and "lesson time" described by the FRT companies (Selwyn et al., 2022, pp. 5–6). It should be asked, however, whether roll calls are mere burdensome routine tasks, and the answer from teachers seems to be that they are not.

Australian teachers in Selwyn's (2022; see also Selwyn et al., 2023) study emphasised that roll calls are not just a way to check whether a child is in a classroom, but allow teachers to actually greet the child and welcome them. They also stated that "for a new teacher the roll is a crucial process to get to know who is there. With the repetition, by the end of term you do get to know their names" (Selwyn, 2022, p. 81). In addition, the teachers pointed out that traditional roll calls provide a chance to show a little discretion: "If a kid was having troubles and was persistently late you might opt to delay taking the roll until 10 minutes into the lesson so they don't show up as being late yet again. If the roll is taken automatically in the first minute, then you don't have that leeway" (Selwyn, 2022, p. 81). The extracts strongly suggest that automation of roll calls decreases teachers' possibilities to build dialogical I–Thou relationships with students, as it takes away daily opportunities to greet the children, sense their moods, and create meaningful relationships with them. Additionally, preset rolls narrow teachers' possibilities to express sensitivity to students' challenging life situations as they allow no room for flexibility. To conclude, while automation of roll calls may increase the number of hours spent on learning and lessons—instructional education, in other words—teachers' reports suggest that the very same time is taken away from pedagogy.

Concluding remarks

In this conceptual paper, I have addressed different kinds of pitfalls of intensifying digitalization, datafication, and automation of education for the nature of teacher-student relationships. Theoretically, I have drawn on Buber's (1937) ideas of the dialogical I–Thou and objectified I–It as the key forms of human relationships to complement previous research on the same topic. Instead of treating I–It and I–Thou as mutually exclusive categories, I have suggested that the two could be approached as a continuum, as in our interactions with other people there is always some It in Thou, especially in the context of formal education. Furthermore, I have discussed Biesta's (e.g., 2014) writings on the different forms (instruction and pedagogy) and purposes (qualification, socialization, and subjectification) of education to better contextualise Buber's (e.g., 1937) ideas to formal education.

My core argument was that digitalization, datafication, and automation, in their different forms, works within the logic that steers teacher-student relationships towards the objectified I–It relationship instead of the dialogical I–Thou relationship. During the course of this article, I have demonstrated how the objectified "It" is present in popular images of children and technology as well as in the more quotidian attempts to compress children and their learning and development into data points that enable automated practices.

While my tone has been critical, I do not wish to present myself as a doomster—a writer of tragedy (Bigum & Kenway, 2005) —who sees digital downsides as an inevitable outcome of technology use in

[5] Calculated based on the number of school days in Finland

education. However, having a suspicious mind is essential in order to distinguish between the actual capabilities of the technologies and the extensive claims and promotional activity embedded in discourses around digitalization, datafication, and automatization of education, which are certain about events, thus leaving little room for alternate outcomes (Mertala, 2020). Certainty and determinism do not fit well with relationality and subjectification, which both emphasise the openness and unpredictability of education. Neither are they backed up by empirical evidence when it comes to the presumed benefits of technology use. Take learning analytics, a central application of the digitalization, datafication, and automation of education, for example. Learning analytics are often claimed to improve learning practices by transforming learning processes (e.g., Baer & Norris, 2017; Viberg et al., 2018).

However, a review of 252 studies suggests that in only 9% of cases were learning outcomes improved via the use of learning analytics (Viberg et al., 2018). Put differently, while there are situations in which learning analytics may be beneficial, the number of such occasions appears rather limited. Thus, commonly-made bold statements such as "learning analytics holds the potential to transform the way we learn" (Baer & Norris, 2017, p. 309) are plausible only if the undesired I–It relationships are included among the possible forms of transformation.

By the use of the word "possible" in the previous sentence, I wish to be explicit that while the arguments presented in this paper are grounded in a careful reading of the theoretical and empirical research literature, they are inevitably speculative and hypothetical. There is an urgent need for empirical research that aims for a comprehensive understanding of what intensifying datafication and automation means for student-teacher relationships. Contemporary technology- and data-saturated classrooms are not short of suitable and information-rich cases, as the various examples provided throughout this paper have illustrated. For instance, the "student at risk" dashboard stories (Jarke & Magilchrist, 2021) would provide an interesting context in which the theoretical and conceptual ideas presented in this article could be put into action.

Declarations

Authors' Declarations

Acknowledgements: Not applicable.

Authors' contributions: This is a single-authored paper.

Competing interests: The author declares that they have no competing interests.

Funding: This work was supported by the Research Council of Finland. Grant number: 355523.

Ethics approval and consent to participate: The paper is conceptual and involves no human participants.

Publisher's Declarations

Editorial Acknowledgement: The editorial process of this article was completed under the editorship of Dr. Mehmet Toran through a double-blind peer review with external reviewers.

Publisher's Note: Journal of Childhood, Education & Society remains neutral with regard to jurisdictional claims in published maps and institutional affiliation.

References

Andrejevic, M., & Selwyn, N. (2020). Facial recognition technology in schools: Critical questions and concerns. *Learning, Media and Technology, 45*(2), 115–128. https://doi.org/10.1080/17439884.2020.1686014

Aspelin, J. (2020). Teaching as a way of bonding: A contribution to the relational theory of teaching. *Educational Philosophy and Theory, 53*(6), 588–596. https://doi.org/10.1080/00131857.2020.1798758

Baer, L., & Norris, D. (2017). Unleashing the transformative power of learning analytics. In C. Lang, G. Siemens, A. Wise, & D. Gašević (Eds.), *Handbook of Learning Analytics* (pp. 309–318). Society for Learning Analytics Research.

Beerwinkle, A. L. (2021). The use of learning analytics and the potential risk of harm for K-12 students participating in digital learning environments. *Educational Technology Research and Development, 69*(1), 327–330. https://doi.org/10.1007/s11423-020-09854-6

Biesta, G. (2016). The rediscovery of teaching: On robot vacuum cleaners, non-egological education, and the limits of the hermeneutical worldview. *Educational Philosophy and Theory*, *48*(4), 374–392. https://doi.org/10.1080/00131857.2015.1041442

Biesta, G. (2020). Risking ourselves in education: Qualification, socialization, and subjectification revisited. *Educational Theory, 70*(1), 89–104. https://doi.org/10.1111/edth.12411

Biesta, G. (2022). *World-centred education: A view for the present.* Routledge.

Biesta, G. J., & Miedema, S. (2002). Instruction or pedagogy? The need for a transformative conception of education. *Teaching and Teacher Education, 18*(2), 173–181. https://doi.org/10.1016/S0742-051X(01)00062-2

Bigum, C., & Kenway, J. (2005). New information technologies and the ambiguous future of schooling—Some possible scenarios. In A. Hargreaves (Ed.), *Extending Educational Change* (pp. 95–115). Springer.

Bradbury, A., & Roberts-Holmes, G. (2017). *The datafication of primary and early years education: Playing with numbers*. Routledge.

Buber, M. (1937). *I and Thou*. T. & T. Clark.

Buber, M. (1968). *Between Man and Man.* Macmillan.

Charmé, S. (1977). The two I–Thou relations in Martin Buber's philosophy. *Harvard Theological Review, 70*(1–2), 161–174.

Crawford, K. (2021). *The Atlas of AI.* Yale University Press.

Daliri-Ngametua, R., Hardy, I., & Creagh, S. (2022). Data performativity and the erosion of trust in teachers. *Cambridge Journal of Education, 52*(3), 391–407. https://doi.org/10.1080/0305764X.2021.2002811

Eduten. (2021). https://www.eduten.com/

Eynon, R. (2022). Datafication and the role of schooling: Challenging the status quo. In L. Pangrazio & J. Sefton-Green (Eds.), *Learning to live with datafication* (pp. 17–34). Routledge.

Friesen, N. (2017). The pedagogical relation past and present: Experience, subjectivity, and failure. *Journal of Curriculum Studies, 49*(6), 743–756. https://doi.org/10.1080/00220272.2017.1320427

Hardy, I., & Lewis, S. (2017). The 'Doublethink' of data: Educational performativity and the field of schooling practices. *British Journal of Sociology of Education, 38*(5), 671–685. https://doi.org/10.1080/01425692.2016.1150155

Haslam, N. (2006). Dehumanization: An integrative review. *Personality and Social Psychology Review, 10*(3), 252–264. https://doi.org/10.1207/s15327957pspr1003_4

Hatt, B. E. (2005). Pedagogical love in the transactional curriculum. *Journal of Curriculum Studies, 37*(6), 671–688. https://doi.org/10.1080/00220270500109247

Ifenthaler, D., & Schumacher, C. (2016). Student perceptions of privacy principles for learning analytics. *Educational Technology Research and Development, 64*(5), 923–938. https://doi.org/10.1007/s11423-016-9477-y

Jarke, J., & Macgilchrist, F. (2021). Dashboard stories: How narratives told by predictive analytics reconfigure roles, risk, and sociality in education. *Big Data & Society, 8*(1), 20539517211025561. https://doi.org/10.1177/20539517211025561

Karjalainen, S. (2021). *Doing joy: Performances of joy in children's relations in early childhood and education settings* [Doctoral dissertation]. University of Oulu. https://oulurepo.oulu.fi/bitstream/handle/10024/36647/isbn978-952-62-2974-4.pdf?sequence=1&isAllowed=y

Kirschner, P. A., & De Bruyckere, P. (2017). The myths of the digital native and the multitasker. *Teaching and Teacher Education, 67*, 135–142. https://doi.org/10.1016/j.tate.2017.06.001

Laakso, M. J., Kaila, E., & Rajala, T. (2018). ViLLE–Collaborative education tool: Designing and utilizing an exercise-based learning environment. *Education and Information Technologies, 23*(4), 1655–1676. https://doi.org/10.1007/s10639-017-9659-1

Lasky, S. (2005). A sociocultural approach to understanding teacher identity, agency, and professional vulnerability in a context of secondary school reform. *Teaching and Teacher Education, 21*(8), 899–916. https://doi.org/10.1016/j.tate.2005.06.003

Learning Analytics. (2019). *Example 5: Automating learning analytics*. https://en.learninganalytics.fi/analytics#case__4

Lupton, D. (2021). 'Honestly, no, I've never looked at it': Teachers' understandings and practices related to students' personal data in digitised health and physical education. *Learning, Media and Technology, 46*(3), 281–293. https://doi.org/10.1080/17439884.2021.1896541

Manolev, J., Sullivan, A., & Slee, R. (2019). The datafication of discipline: ClassDojo, surveillance, and a performative classroom culture. *Learning, Media and Technology, 44*(1), 36–51. https://doi.org/10.1080/17439884.2018.1558237

Mayer-Schönberger, V., & Cukier, K. (2013). *Big data: A revolution that will transform how we live, work, and think*. Houghton Mifflin Harcourt.

Merriam-Webster (n.d.). *Automation*. https://www.merriam-webster.com/dictionary/automation

Mertala, P. (2020). Paradoxes of participation in the digitalization of education: A narrative account. *Learning, Media and Technology*, *45*(2), 179–192. https://doi.org/10.1080/17439884.2020.1696362

Mertala, P. (2021). Koulutuksen digitaalinen datafik(s)aatio. *Kasvatus & Aika*, *15*(1), 43–61. https://doi.org/10.33350/ka.100161

Mertala, P., Lopez, S., Vartiainen, H., Saqr, M., & Tedre, M. (2024). Digital natives in the scientific literature A topic modeling based bibliometric analysis. *Computers in Human Behavior*, 108076. https://doi.org/10.1016/j.chb.2023.108076

O'Neill, C., Selwyn, N., Smith, G., Andrejevic, M., & Gu, X. (2022). The two faces of the child in facial recognition industry discourse: Biometric capture between innocence and recalcitrance. *Information, Communication & Society*, *25*(6), 725–767. https://doi.org/10.1080/1369118X.2022.2044501

O'Neil, C. (2016). *Weapons of math destruction: How big data increases inequality and threatens democracy*. Penguin Books.

Pierlejewski, M. (2020). The data-doppelganger and the cyborg-self: Theorising the datafication of education. *Pedagogy, Culture & Society*, *28*(3), 463–475. https://doi.org/10.1080/14681366.2019.1653357

Prensky, M. (2001). Digital natives, digital immigrants part 2: Do they really think differently? *On the Horizon*, *9*(6), 1–6.

Sefton-Green, J., & Pangrazio, L. (2022). The death of the educative subject? The limits of criticality under datafication. *Educational Philosophy and Theory*, *54*(12), 2072–2081. https://doi.org/10.1080/00131857.2021.1978072

Selwyn, N. (2003). 'Doing IT for the kids': Re-examining children, computers, and the information society. *Media, Culture & Society*, *25*(3), 351–378. https://doi.org/10.1177/0163443703025003004

Selwyn, N. (2015). Data entry: Towards the critical study of digital data and education. *Learning, Media and Technology*, *40*(1), 64–82. https://doi.org/10.1080/17439884.2014.921628

Selwyn, N. (2019). *Should robots replace teachers? AI and the future of education. John* Wiley & Sons.

Selwyn, N. (2022). Less work for teacher? The ironies of automated decision-making in schools. In S. Pink, M. Berg, D. Lupton, & M. Ruckenstein (Eds.), *Everyday automation: Experiencing and anticipating automated decision-making* (pp. 73–86). Routledge.

Selwyn, N., Campbell, L., & Andrejevic, M. (2023). Autoroll: Scripting the emergence of classroom facial recognition technology. *Learning, Media and Technology*, *48*(1), 166–179. https://doi.org/10.1080/17439884.2022.2039938

Selwyn, N., Hillman, T., Bergviken Rensfeldt, A., & Perrotta, C. (2021). Digital technologies and the automation of education—Key questions and concerns. *Postdigital Science and Education*, *5*, 15–24. https://doi.org/10.1007/s42438-021-00263-3

Viatech. (2018, August). *Maximizing classroom performance with facial recognition technology*. https://www.viatech.com/en/2018/08/maximizing-classroom-performance-frt/

Viberg, O., Hatakka, M., Bälter, O., & Mavroudi, A. (2018). The current landscape of learning analytics in higher education. *Computers in Human Behavior*, *89*, 98–110. https://doi.org/10.1016/j.chb.2018.07.027

Watters, A. (2021). *Teaching machines: The history of personalized learning*. MIT Press.

Williamson, B. (2016). Coding the biodigital child: The biopolitics and pedagogic strategies of educational data science. *Pedagogy, Culture & Society*, *24*(3), 401–416. https://doi.org/10.1080/14681366.2016.1175499

Winter, P. (2011). Coming into the world uniqueness and the beautiful risk of education: An interview with Gert Biesta. *Studies in Philosophy and Education*, *30*(5), 537–542.

Yu, J., & Couldry, N. (2022). Education as a domain of natural data extraction: Analysing corporate discourse about educational tracking. *Information, Communication & Society*, *25*(1), 127–144. https://doi.org/10.1080/1369118X.2020.1764604