



Tech for Student Well-Being: Exploring Data-Generated Insights in K-12 Education

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Abstract. Student well-being is important for inclusive societies and academic achievement. As studies have shown, well-being is associated with school success. Today, it's common for schools to use different technologies to collect and analyse digital data with the purpose of improving educational outcomes. Generally, this collected data focus on student engagement, attendance, and results, with novel advancements being aimed at supporting student well-being. In this pilot study, we analyse teachers' experiences to identify benefits and challenges during a spearhead integration of a data-driven tool for examining student well-being in upper secondary school. Using thematic analysis of teacher interview transcripts, we identified four themes: insight diversity, caring pedagogies, teacher leadership tools, and faculty transformation. The themes are discussed using the theoretical perspectives of orchestration, practice, process, and actors. Key results show that some high-value benefits teachers report on are gaining insights, saving time, and informing decision-making. The challenges include a lack of systematisation, guidance, and resources, and tensions related to defining the role and responsibilities of a teacher or mentor. We conclude that schools that work to support student well-being can benefit from the diversity of insights and practices related to the presented tool. However, an informed and systematic approach would be needed to leverage the benefit of spearhead integration. The contribution of the study is to provide insights on how a well-being tool can be used in an educational context to bring understanding of student well-being to teachers. Our results may inform decisions and guide integration and implementation practices in schools.

Keywords: Digital competence · Digital literacy · Student well-being · Innovation · Implementation · Integration

1 Introduction

1.1 Supporting Well-Being and Understanding Tool Implementation

In recent years, there has been increasing interest in developing adaptive learning environments that can accommodate the diverse needs of learners [1, 2]. The rationale is that collecting and analysing data on learning processes in real-time can provide insights

into the effectiveness of educational interventions and enable personalised support for learners [3]. However, to make sense of the data and apply it effectively, a strong theoretical background is required that can explain how different variables and factors affect learning outcomes [4]. One promising area of research that integrates data analytics and student well-being is using digital tools to support student well-being. Research has shown that student well-being is critical to academic achievement and inclusive societies [5]. By collecting data on students' emotions, behaviours, and attitudes, teachers and school leaders can gain insights into the factors contributing to student well-being and make informed decisions about supporting students' social and emotional needs [6]. Previous research has pointed out that it is particularly critical to consider how schools can ensure that the data is used in ethical and responsible ways that respect students' privacy [7] and develop their pedagogical approaches, using these insights, to support students' learning and well-being in meaningful ways c.f. [8]. Despite its significance, there is a noticeable scarcity of research on how data-driven methods can promote student well-being, particularly for K–12 students. Most of the existing research focuses on university-level students [9, 10]. Where, for example, [11] explored university student's adoption of technology in relation to their well-being, from the Technology Acceptance Model, and concluded that even though university students seem to display a growing acceptance of mobile applications, more research is needed, both that include other populations and build on empirical data. As theoretical insights are critical, but without empirical finding there is a risk that future theories will not reflect what is happening in situ [11]. To contribute to this gap, we explore the K-12 contexts. Researchers, e.g., [12] emphasize the crucial role teachers play for student well-being. This study extends that discussion by approaching the experiences of implementing and using a well-being application from the teacher's perspective, an aspect that, to our knowledge have not yet been explored in existing literature. Research questions posed in the study are:

1. What benefits do upper secondary school teachers report when utilising a data-driven tool aimed to support student well-being in schools?
2. What challenges do upper secondary school teachers report when utilising a data-driven tool aimed to support student well-being in schools, and how do these challenges impact the integration and successful implementation of such a tool in educational settings?

The primary objective of the study is to explore teacher perception of how a tool, used to provide data-driven insights is impacting them in their roles as teachers and mentors. Exploring these implications from a multi-theoretical approach we consider stakeholders' varying purposes, roles and conditions for use and interaction to offer insights that may inform an improved integration of similar tools, and improved educational strategies and interventions.

2 Background

2.1 The Importance of Well-Being in Education

As a way to address student well-being and assist students with developing and maintaining healthy habits, educational institutions have made student well-being a priority, developing formal strategies and frameworks for addressing student mental health

e.g., [13–15]. The European Commission [16] emphasises the necessity of well-being at schools, highlighting the rise of mental health issues amongst school children and the additional challenges brought about by the Covid-19 pandemic. Internationally, countries like Australia, New Zealand, and Scotland have integrated well-being into their educational policies [12]. The OECD’s recent PISA results also indicate a decline of well-being as it is related to students’ sense of belonging, highlighting the timeliness of this research [17]. While there is no definite agreement on the boundaries of well-being in schools [18], researchers currently relate the concept to the school environment [19] and how positive influences on well-being may be account for calm, peaceful, and fun atmosphere [20], meaningful engagement [21], supportive relationships [20, 21], and negative influences by for example teacher stress [22], lack of social status, withdrawal and disengagement [23]. Thus, there may be some variations of what teachers mean when they talk about supporting student well-being in school. Still, an everyday understanding of well-being that aligns with the mentoring descriptions seems to relate to having an affective mode that does not hinder learning, engaging in learning in a meaningful way, and having functional relationships and a supportive environment. Whilst “well-being” is a commonly understood term in ordinary language, it is a broad and multifaceted concept, with cultural connotations and subjective properties, which does not easily lend itself to any general definition or measurement independent of context. Any attempt to generally define “well-being”, even in an educational context, uncovers a wide range of yet multifaceted sub concepts which would require further clarification for scientific scrutiny. For example, the European Commission defines well-being in terms of eleven aspects, ranging from feeling safe, valued, and respected, to social engagement, self-esteem, self-efficacy, autonomy, personal relationships, a sense of belonging, happiness, and life satisfaction [16].

2.2 Data-Driven Approaches to Support Student Well-Being

Existing research on data-driven insights (focusing on university-level students) have shown that internal factors (experiencing pain) and external factors (like duration of electronic device use) have been associated with student stress which in turn was associated with problems like burnout and depression [9] and poor sleep quality [10] and the effects of non-ergonomic study positions on student physical well-being (when students study from home) [24]. Other approaches analysed student emotion, as academic emotions provide insight into the student well-being for both on-site and online learners [25] and used wearable sensors to detect student academic emotion [26], Fitbit and smartphones to detect loneliness [27]. In addition, we have seen initial contributions to theory and concept development to better understand student well-being as aspects related to worrying, health, and social factors when artificial intelligence (AI) is used to categorise and rate students’ state and behaviour, e.g., [28].

2.3 The Balance Between Well-Being and Academic Performance

There exists a delicate balance between fostering well-being and achieving academic excellence [12]. While insights into student well-being can inform interventions that support stress-management and academic re-engagement, as also noted by [29], a study

that used AI and traditional statistical measures to distil data-generated insights on upper secondary students in Portugal found this approach to be more accurate than traditional methods [30]. However, the experiences of well-being applications and the data generated on student well-being may be considered an internal matter by schools, which may cause them to be reluctant to share their insights. In this regard, it would be difficult to determine the experiences and effects of interventions on teachers and students [11]. Nevertheless, it has been argued that continuous, systematic data analysis can lead to sustained school improvement [31]. [31] encourages school leaders and educators to create a culture of inquiry where data-based insights are utilised to identify areas of improvement, develop strategic plans, and evaluate the effectiveness of their actions. While research on wellbeing application in education overall is scarce, novel research, e.g., [9, 25, 30], on data-driven insights and well-being in higher education highlight how this is still developing, and the first K-12 initiatives are only just starting to be published.

3 Methods and Materials

3.1 Context and Participants

The software, EdAider Wellbeing, was developed in 2020 to assist schools with supporting insights to promote student well-being. The software tool was developed with school personnel, students, and researchers within a national research and development program (R&D) focused on data-driven school improvement organised by an independent research association: Ifous (Innovation, research and development in school and preschool). Now being used in around 20 schools in Sweden, it offers three features: facilitating high-frequency scientifically based screenings of a student's performance, providing students, teachers, health teams and school leaders with data insights that facilitate student reflection and learning about well-being as well as timely evidence-based interventions and data-driven feedback. During the R&D program, the authors established connections with schools. As three schools had used the tool the longest, we approached the principals and asked if they could suggest teachers, that used the tool from the start and who would have time for an in-depth interview. Adopting purposive sampling [32], we only approached teachers who were active users of the tool. Six teachers from this subset of schools were chosen for in-depth interviews, for this pilot-study, with a more comprehensive study under way. The teachers had varying years of experience: the one with the most experience had taught for 25 years, four teachers had 20, 16, 15 and 10 years of experience, and the one with least experience had taught for 4 years. All participants provided informed consent before data collection. In Swedish schools, a mentor is a teacher who supports, guides, and monitors a group of students' academic and social development. Swedish schools have mentee groups that are assigned to a mentor. Mentee groups are usually students from one class who share academic and developmental experiences. The mentor thus plays a dual role in the student's educational journey: They actively engage in strategies aimed at fostering emotional and psychological well-being, as well as assist the student's academic progression by providing feedback, engaging in dialog, and offering academic guidance.

3.2 Data Collection and Analysis

Data were collected at three upper secondary schools in Sweden during March and April 2023, following informed consent by the participants. Interviews ($n = 6$) with teachers (two female, four male) were conducted and recorded online using a videoconferencing application. A total of 204 min were subsequently transcribed verbatim. We adopt a reflexive approach to thematic analysis [33] and followed a six-step methodology suggested by [34]. The reflexive approach to thematic analysis, is rooted in qualitative inquiry [33, 35] and emphasises the importance of researcher subjectivity and the situated, interpretative nature of the analysis [33] rather than seeing interrater reliability as a marker of quality. This method was selected as it is suitable for well-being analysis [35] and interview data [36]. Each phase of data analysis was conducted by all authors in order to ensure transparency and rigour.

1. Initial familiarisation with the data: All four authors became acquainted with the general interview findings using a fully inductive approach (within the context of using the well-being tool). This entailed rereading the transcripts, making initial notes, and discussing the results as a group. During our meeting we both discussed initial themes and codes, thus our thematic analysis process was iterative, allowing us to revisit earlier stages as new insights emerged [35].
2. Developing initial codes: Following the generation of initial codes, the authors divided the interview transcripts and coded the data separately. This was accomplished by identifying meaningful data segments and labelling them. The codes were then distributed to the group, and the authors convened to discuss their individual coding and any emerging tentative themes. For example, with regards to “Insight diversity” the authors agreed that the data revealed gaining access to insights that the teachers had not previously had, not limited to well-being. Thus, instead of limiting the tentative theme to motivation and well-being insights, we agreed that there was diversity in the insights gained.
- 3-5 Themes: searching for themes, reviewing themes, and defining and designating themes: In meetings, while a high level of agreement among authors was observed for tentative themes, the focus was to adopt a reflexive approach to thematic analysis, rooted in qualitative inquiry [35]. This reflexive approach provided the freedom for each author to expand on their individual interpretations without being constrained by predefined codebooks or similar methodologies. As part of this process, the themes were reworked, and the data were categorised to capture the essence of the participants’ experiences. The tentative themes were discussed thoroughly to attain the same comprehension, and representative interview excerpts were selected. To maintain transparency throughout the analysis the authors continuously discussed their interpretations. This iterative strategy allowed for refining and elucidation of the themes, ensuring they were precisely defined and labelled.
6. Creation of the report: The final step involved incorporating the findings of the thematic analysis into a cohesive and consistent narrative. This included providing evidence from the data to support the identified themes and clearly explaining their significance within the context of the research question [34, 35].

3.3 Theoretical Lens

Recognising the need to balance well-being and academic performance, we have chosen a multi-theoretical approach to analyse data, including consider stakeholders' varying purposes, roles and conditions for use and interaction, orchestration aspects [37], collaborative learning [38], exploring both the micro- and macro level perspectives. The framework combines four dimensions: *I. Orchestration aspects* relating to design and planning, regulation and management, adaptation, flexibility and intervention and awareness and assessment, *II. Phases of pre-active, interactive, and post-active pedagogical practices* that are supported, *III. Target actors, i.e.,* students, teachers, and researchers; and *IV. Levels of the iterative process*, considering both micro- and macro levels. A description of the dimensions I-IV is provided below.

3.3.1 Orchestration Aspects

[37] included orchestration aspects proposed by [38]. They developed a framework for constructing learning analytics (LA) solutions that include four functional orchestration aspects: 1. Design and planning: preparing learning materials and methods. Applications that generate data-driven insights support the design of learning activities, 2. Regulation and administration: coordinating educational processes. LA tools provide essential operational data. 3. Adaptability and intervention: adjusting to unanticipated events or novel duties. Tools for learning analytics facilitate task adaptation, and 4. Awareness and evaluation: gaining insight into the learning processes of students. The range of tools includes visualisations and predictive approaches, and the fifth factor examines the roles of teachers, students, and other stakeholders in relation to the tools.

3.3.2 Phases of the Pedagogical Practice

Second, [37] included specific aspects from the Implementing Collaborative Learning in the Classroom (ICLC) framework by [38], which specifies five teacher competencies: planning, monitoring, supporting, consolidating, and reflecting. These competencies are mapped to the teaching practice's pre-, interactive, and post-active phases. Pre-active entails designing and preparing learning activities; planning is the primary skill. Typically, this occurs before the activity but can also be modified during the activity or redesigned afterwards. In interactive learning, the teacher facilitates the learning process and guides the students while monitoring, scaffolding, and consolidating. In the post-active phase, the teachers evaluate the outcomes and make modifications for future sessions.

3.3.3 Target Actors

Third it is also critical to consider stakeholders' varying purposes, roles and conditions for use and interaction. Here, we follow [37], and include students, teachers, mentors, and individuals in the community of research (where applicable).

3.3.4 Levels of the Iterative Process

Fourth, the combined analytics framework employs perspectives at the micro- and macro levels. Building on [37, 40], propose that the micro level encompasses the iterative process of data-generated insights and how these support each pedagogical phase. Teachers *have access to data* but need *awareness* of how to use it, *reflect* on the relevance of the data, and request new insights to support *sensemaking* to impact student behaviour or induce new meaning. The macro level, on the other hand, addresses the workflow across multiple lessons, allowing tools to provide support for abstracted insights.

4 Results

We identified four themes related to teachers' use of the well-being tool: *I. Insight diversity* relates to context-dependent data and emphasises the need to understand contextual influences in order to interpret data relevantly, *II. Caring pedagogies*, which reflect experiences in relation to improving the learning environment, educational participation, and school success, *III. Teacher leadership* reflects teachers' use of the tool for operational and strategic purposes; and *IV. Faculty transformation* deals with reports on tensions in relation to the teacher role.

4.1 Insight Diversity

The teachers reported using the tool to acquire different kinds of insights that were otherwise unavailable to them. These insights allowed teachers (and students) to gain insight into individual students' motivation and well-being in a continuous way compared to traditional practices, and thus in a timely manner, identify who may need support, in addition to program-level insights.

To the individual parent-teacher meeting [we want the students to use the tool to] that they [the students] explore specific data and check historically: "How has it looked historically" and "What is the reason for that?", "How do you want it to be in the future?", "How will we achieve it?", "What should we do differently?" and so on. [...] So if there is something that we need to do to support the student, you have to pay attention to that. It's clear that if they have an exam the next day, then the workload might be perceived as high [due to that]. So, you might have to think about checking [data] over time so that you do not point to something that applies to one day only.

[...]

(sitting with the application open)... now when I look at...(scrolling)...for example...I see here that it is quite clear that the girls here have much lower ratings on motivation, for example, which is perhaps a picture you have not seen elsewhere before. Of course, anyone can have a problem with motivation, but we often have the personal chats with the boys. (Teacher 3)

However, timeliness and being sensitive are key, teachers say; otherwise, students may stop revealing how they feel. Teachers underline that it must be ok to "have a bad

day,” feel stress, test anxiety or mood swings without these being investigated. Thus, the insights provided may be diverse in nature, reflecting both program level and individual perceptions and experiences. Underlying influencing factors may differ, which is why contextual awareness is key. Based on a contextual understanding, teachers may decide if it’s appropriate or not to address the issue with the student or student group. Teachers suggest this decision be made with colleagues, followed by a tactful, sensitive, and respectful approach. Whilst gaining new insights two of the teachers also shared their reflections on students’ attitudes towards using the tool.

Because now it’s more just like something they need to do, a necessity they have to go in and click on, and they do that quickly just to finish earlier, that is. (Teacher 5)

The students have, for example, mentioned that they don’t see it as that important because we haven’t spent much time on it. (Teacher 2)

Acquiring insights inevitably means that teachers and schools have the possibility to intervene if a group or an individual signals a decrease in the parameters measured or adjust and continue an ongoing intervention. However, how teachers frame using the tool, the time they dedicate, and how they then use it would influence student perception. If there is no framing or further use of the tool, students could approach it as rather pointless. However, teachers also reported that some students seemed to view it as a valuable opportunity to make their thinking about their well-being more concrete, which could help them to self-regulate and express their feelings.

4.2 Caring Pedagogies

The third theme, Caring pedagogies, reflects teachers’ views of supportive learning environments encouraging student well-being, educational participation, and success. The teachers, for instance, point out that the tool strengthens their capacity to identify students that need attention on an individual and group level, to improve aspects of social relations, and their capacity to address students’ performance dissatisfaction and sense of self-worth.

For my part, it’s like there are two perspectives: partly, it’s individual, finding individual students who are having a tough and difficult time, but it’s also very interesting on a group level, as well. Because the mentors have an extra responsibility for their own students, but in our work team, you are also part of the responsibility for the entire grade year, so to speak. According to the value-based work, we can work further on questions: “Is there a problem with the social relations between the students?” Well, maybe we need to add group-strengthening activities here for a while now, for example. And when students are dissatisfied with their performance, yes, but then maybe we should have a conversation about it. So, talk a little about education, grades, and value: “It’s not just your grades that make up your worth. You are more. - Like that.” (Teacher 3)

If you start asking questions about students’ well-being, you may also have to be prepared to act for students’ well-being. If you as an organisation are not ready

for that, it seems silly to ask lots of questions about how the students are doing, and then the students notice that there will be no difference. I say week in and week out, something like, “You’re lying bleeding like that”, and you say, “I’m bleeding, I’m bleeding”. Yes, we have received information, but there will be no plasters or bandages, either. So, what capacity does one have to receive it? (Teacher 1)

The teachers describe the importance of being responsive to the findings, for example in initiating *group-strengthening activities*. On the other hand, the teachers were not talking about value-based work or psycho-social support as something being generally agreed in between colleagues. Rather, it seemed to be up to each teacher to determine how to respond or not. An implication of such approach may be that if students notice that their data did not come to use, e.g., that the school was not using the data to making improvements, that the students may question the necessity of sharing how they feel.

4.3 Teacher Leadership

Recognising that teachers’ roles extend beyond classroom responsibilities and instruction is important. Teacher’s report being part of a decentralised leadership system in which they use the tool to save time, gain insight and ensure they provide effective student support.

As I teach English, I don’t take the students aside for mentor-related reasons. Then this tool gives me a good overview; that I can still see if there is someone marked on red, so I can reach that student. So, there is definitely a possibility that I will get insight into aspects that I would not have time to discover during an 80-minute, quite packed lesson”. (Teacher 4).

Above all, I think there is value in the fact that changes we want to make (possibly costing the school money) can be supported [by data]. Then it is good to have a tool showing them [the school leaders] that there is something to improve here. It’s not just that we [the teachers] have some insignificant opinion [...] then you are met by the school management: “Yes, and we are looking into it”, and then nothing happens. Now we can show the data. (Teacher 6)

Apart from using the tool operatively to ensure all of their mentor students are on track, teachers also point to using the data to underpin strategic decision-making, being able to present something to school leaders that may support an experience or a feeling of a situation with generated data that may reflect duration, intensity and spread of a problem.

4.4 Faculty Transformation

Faculty roles are changing as educational systems change. In the classroom, trust, respect, and well-being are now prioritised. However, teachers may object to having to take on responsibilities in relation to student well-being.

That was one of the reasons I wanted to use this tool - because it would be a way to save time. But by using it - I also accept taking on this role. If I identify that the

students mark certain answers, then I must follow up! How will I get that time? How do I take those calls in a good, proper way? I became a teacher to teach. I didn't become a teacher to talk about well-being with teenagers. I don't feel super comfortable in it. I don't feel trained in it. I am very worried about it and handling that task well. (Teacher 6)

[We] have developed from a school where the teacher's role was defined as somewhat more authoritarian [...] to a school where the relational aspects like trust and respect matter more... (Teacher 1)

Modern faculty roles change as relational features are added to traditional instructional approaches. Some educators recognise the benefits of establishing trust and respect in the classroom, but others worry about their capacity to adapt and handle their new responsibilities. While teachers' approaches differ, none of the teachers interviewed reported being formally trained to handle psycho-social well-being. To ensure the best outcomes for students and educators in this quickly changing educational landscape, educational institutions must give proper training and support to teachers.

5 Discussion

In this paper, we explored upper secondary school teachers' experiences using a data-driven tool to support student well-being. Our research questions revolved around what benefits and challenges upper secondary school teachers experience when using data-driven tools to support student well-being, and how these factors impact successful implementation and integrating the tool into educational settings. We identified four themes: Insight diversity, Caring pedagogies, Teacher leadership and Faculty transformation, which we discuss using the theoretical lens suggested by [37], which includes orchestration aspects, phases of pedagogical practice, target actors, and levels of the iterative process. Our findings show that the well-being tool does present possible solutions that may support teacher by providing insights into student well-being, motivation, and other areas where support may be needed, which are imperative to identify the diverse needs of learners [1–3]. Drawing on the insights from the well-being data, we discovered a variety of perspectives, categorised as Insight Diversity under our first theme. This multi-faceted understanding broadens the utility of our tool, facilitating its application at various levels - from individuals, groups, or classrooms, up to broader program levels. This, in turn, could indicate areas of potential organisational improvement.

Exploring opportunities and challenges in Caring pedagogies (theme II), we noted that a key value is an incentive for the teacher collective to focus on the interpersonal values of high-quality relations and social support structure, where this well-being tool can capture data (which is otherwise illusive) to illustrate states, improvements, effects of interventions and identification of other critical factors, e.g., [29, 31]. Schools are generally advised to think about creating welcoming social learning environments that enable and support the well-being of their students [16, 17]. However, the challenges mentioned imply that many teachers might not feel prepared to address problems with students' well-being or to organise value-based and group-strengthening activities in response to the well-being tool. Knowing what interventions could work and having the capacity to

address issues related to student well-being, are not the same. Extending the findings of [40] we found that there are large variations in quality and time between schools. Almost all teachers expressed a lack of guidance in addressing aspects like emotional, social, and physical well-being. None of the teachers reported being professionally trained to guide and meet students in need to help them excel. These shortcomings may impact the experienced lack of resources (insufficient time, instruction, and guidance) and feelings of insecurity. However, with informed and guided leadership, exploration could be more systematic in the received values and visions.

As has been pointed out elsewhere, this includes highlighting what competencies teachers need to develop their pedagogical approaches and using these insights to support students' learning and well-being in meaningful ways [8, 29]. We did see example, in mentoring sessions and parent-teacher meetings, when a detailed focus or self-monitoring can support meta-cognition, which has been shown to improve cognitive outcomes [4]. With insights being used to inform teacher(s) (and parents) of a potential need for more social support. While the data-driven insights on well-being can inform planning and preparation in the pre-active phase, these insights were currently not intentionally directed toward learning activities, to support meta-cognitive abilities, evaluate intervention, or providing feedback when a student improves their well-being. This indicates that more guidance is needed on how to use the tool, but also, that schools can share their innovative adaptations of the tool, thereby fostering a supportive community for learning and growth.

The data-driven approach creates a number of unique values for various actors in school, enabling new effective methods that strengthen the school's ability to work preventively and improve their students' well-being in a continuous manner. A key value which emerged under the theme Teacher leadership (theme III) reflects opportunities of using the well-being tool to inform strategic and operational decision-making. Indeed, one challenge related to when teachers have the time to use the well-being tool and how the tool-use is used with students. We note a lack of theory to support integrating learning analytics tools. Theoretic grounding can provide teachers with a strategy for using data-driven insights to guide classroom instruction e.g., [38]. This can improve the school's ability to employ a scientific and evidence-based approach for building school improvement capacity and continuous data-driven school improvement. Building on [37, 40], the micro level encompasses the iterative process of data-generated insights and how these support each pedagogical phase. We see that teachers have access to data but need awareness of how to use it, reflect on the relevance of the data, and request new insights to support sensemaking to impact student behaviour or induce new meaning. On the macro level, on the other hand, addressing the workflow across multiple lessons or at the organisational level, the well-being tool was reported to provide support for abstracted insights. However, such opportunities also embed tension in what a teacher or a mentor is, in which teachers report on restrictions of resources and a need to empower teachers as leaders in decision-making and management. Indeed, the tensions also make visible that there are ongoing negotiations on what teacher and mentor roles may be, as identified by Faculty transformation (theme IV). This concerns if and to what extent schools are responsible for student well-being and how this would impact relational aspects and responsibilities, which in turn highlights the need to approach tensions in

the development of the extended teacher/mentor role(s). This appears to be critical as the teacher and/or mentor role, is potentially influenced by the introduction of AI and data-generated insights.

6 Conclusion

In conclusion, previous research shows that student well-being is a major concern in education, and that there is a concerning gap in data-driven research on K–12 students' well-being in particular. The present study also contributed with insights into how the use of a data-driven tool can provide benefits to students, through: 1) focusing on students' well-being, thereby providing an otherwise elusive metric, 2) offering insights at multiple levels – individual, class, and school – enabling targeted interventions, 3) encouraging data-informed actions such as the implementation of group-based activities, and 4) facilitating the development of caring pedagogies, thereby fostering a nurturing educational atmosphere. However, to fully exploit these transformative potentials, several challenges must be confronted. While this study contributes with teachers' experiences of using a data-driven tool for student well-being, the teachers highlight that the well-being tool influences a range of aspects in current practices for example, the need to agree on guidelines for operational use, data literacy, teachers' role, and responsibilities in relation to caring pedagogies, and educational improvement. All these dimensions are important for understanding the relationship between students' overall well-being and academic performance. In addition, we found that using any tool must be appropriately incentivised for both students and teachers, where competence, resources and leadership guidance is critical for effective outcomes.

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