The Integration of Student Well-being Following a HCLA Approach: Challenges and Recommendations

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Abstract

Integrating student well-being into Learning Analytics (LA) is vital for fostering holistic educational success beyond traditional academic metrics. Grounded in the Self-Determination Theory (SDT), the Well-being Journey (WB Journey), as a tool, exemplifies this integration by evaluating well-being, offering visual analytics, and providing tailored recommendations. Future avenues for this tool include exploring the use of Generative AI (GenAI) to refine current recommendations, making them more effectively tailored to support students' self-regulation. However, many limitations and challenges are posed, especially regarding ethical concerns. This paper calls for discussion regarding these same concerns, encompassing the integration of well-being data into LA, and the use of GenAI in aiding the process of well-being recommendations' validation and quality control.

Keywords

well-being, student well-being, human-centered learning analytics

1. Introduction

The increasing recognition of well-being as a critical component of student success in higher education [1] highlights the necessity for developing evaluative well-being instruments that are both effective and sustainable [2, 3, 4, 5]. Moreover, the integration of such instruments into educational systems should be seamless and supportive, ensuring that they not only diagnose potential well-being issues but also guide interventions and track progress over time [6, 1]. In doing so, educational institutions can move beyond traditional academic metrics (typically used in Learning Analytics) to embrace a more inclusive and emotional view of learning success, one that encompasses the well-being of students as essential to their academic and life achievements [7, 8, 9].

In this line, one of the main challenges this paper poses for the HCLA community is addressing the well-being of students as a key factor in their learning experience. HCLA, as described per [20], examines data on student learning, including engagement with course materials, assessment performance, and social interactions. If human-centeredness is integrated into the design of LA to address key human behaviors and learning processes, it is critical to point out the necessity to also address well-being as an active agent in the whole learning experience [7, 8, 9].

To address this challenge our work delves into the design and preliminary evaluation of a digital tool aimed at collecting, monitoring and promoting student well-being both on an individual as well as class basis: The Well-being Journey (WB Journey). We leverage the principles of the Self-Determination Theory (SDT) [10]. SDT posits that fulfilling the basic psychological needs for autonomy, competence, and relatedness is essential for fostering intrinsic motivation, well-being, and personal growth. In the realm of education, this theory highlights the importance of creating learning environments that support these needs, thereby promoting students' self-motivation and

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engagement with their learning environment [11, 12]. Through applying SDT as a guiding philosophy for the development and implementation of well-being instruments, educational systems can more effectively address the well-being needs of students [13, 10, 14]. Furthermore, integrating the SDT into the assessment and enhancement of student well-being ensures that educational practices not only aim at academic excellence but also at cultivating environments where students feel empowered, capable, and connected [14, 15].

1.1. The Well-being Journey

The WB Journey seeks to provide a nuanced understanding of students' psychological needs, through collecting data about their learning experiences and offering tailored recommendations to enhance their well-being within an educational environment. The tool is designed to fulfill a similar set of objectives for students as those associated with the Learning Analytics Dashboards (LADs), which [16] categorize into six primary goals: (1) to enhance retention and academic performance, (2) to assist students in understanding their contribution to group work for its improvement, (3) monitor student interactions within digital learning platforms, (4) offer visual representations of learning outcomes alongside class or group comparisons (5) facilitate student self-reflection and awareness regarding their learning processes and (6) encourage reflection on and awareness of their activities. And while the WB Journey does not directly offer features to cover the two first goals, several studies have stated that a positive well-being in the learning experience is linked to contribute not only to personal flourishment but also to learning outcomes [17, 8, 18, 19], both individually and collectively as a class. As for the four latter goals, the WB Journey aims to achieve them through several features: goal 3 ⟶ to monitor student interactions within digital learning platforms through digital well-being evaluations (i.e. readily available tools to evaluate the digital aspects of learning. See figure 1a); goal 4 ⟶ offer visual analytics depicting students' well-being evolution over time regarding their learning experiences (figures 1b and 1c); goal 5 ⟶ generate recommendations and actionable feedback to facilitate student' self-reflection and well-being improvement (figure 1d); goal 6 ⟶ similar to goal 5, the given recommendations will facilitate reflection and awareness of their learning activities and experiences (figure 1d).

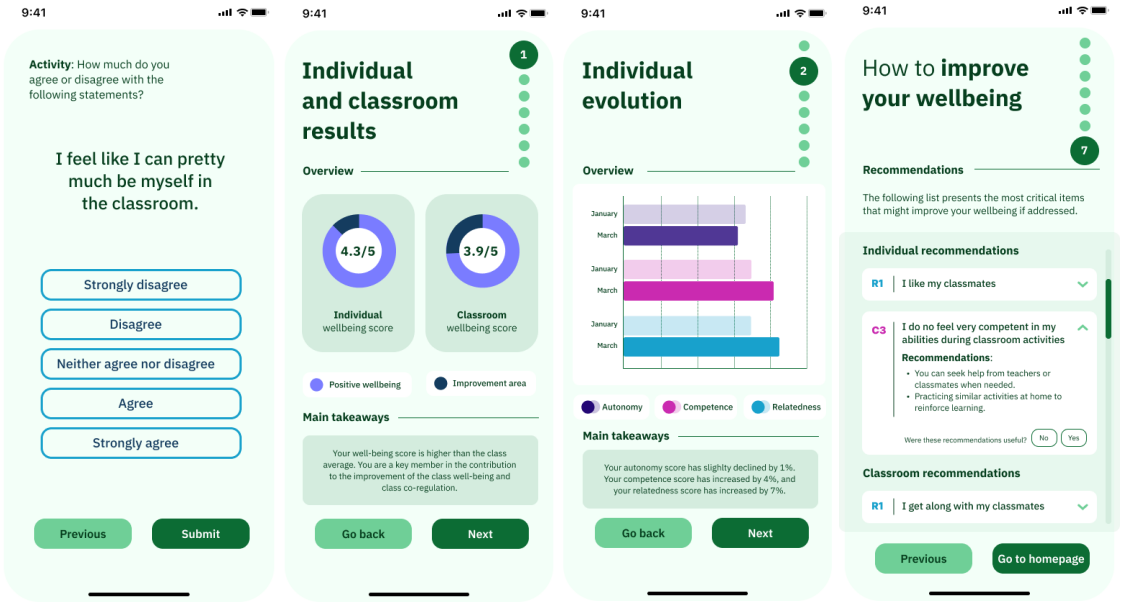

Figure 1a. Data collection; **1b.** Individual and class data; **1c.** Individual data; **1d.** Recommendations.

As a tool grounded in the SDT, the data collection process (Figure 1a) employs SDT-based questionnaires, which facilitates collecting self-reported data on the needs of autonomy, competence and relatedness. These SDT-based questionnaires, drawn from literature (e.g. the METUX model of digital well-being proposed by [28]), are selected and curated into a library within the tool, from which teachers can choose, based on what kind of well-being they want to collect; e.g. digital well-being, classroom well-being, and so on. The purpose of this library is to collect a wide range of well-being instruments (always based on the SDT), therefore it is not a closed collection of instruments but rather a growing and evolving one.

The design of the WB journey takes on a co-design approach, initially based on a vision of the authors' based on found research gaps, such as integrating well-being in LA reports [7, 8, 9], where stakeholders are involved in the different design stages and pilots of the tool. The tool's main target are freshmen, where it aims to address the potential lack of self-regulatory skills within this group of students [21], since students equipped with self-regulation skills are "more likely to set clear and realistic goals, use strategies, self-monitor, and evaluate their progress, completing tasks on time and reporting high levels of motivation." [22].

The initial design phases carried out studied the fulfillment of goals 3, 4, 5 and 6, as well as the overall user experience. Though the results were positive [27], the recommendations feature (which currently presents a list of literature-based recommendations previously reviewed and adapted by a panel of experts) still had some limitations such as: (1) the little variety in the recommendations to help self-regulate and (2) its limited adaptability to potential patterns, addressing items in isolation. Therefore, the next step in this work is to address the recommender system (goals 5 and 6) through a co-design approach with experts.

The co-design process is still ongoing. A number of improvements have been made through student feedback after interacting with the initial mockups of the app, where they asked for improvement or features such as: adding the option for students to add their own recommendations. This addition was requested because (1) students are more likely to find experiences/recommendations by other students relatable, (2) it will help them make informed decisions when choosing a course and prepare for it (based on the well-being reports of each course, for instance), and (3) it will provide a wide repertoire of recommendations (connected to point 1).

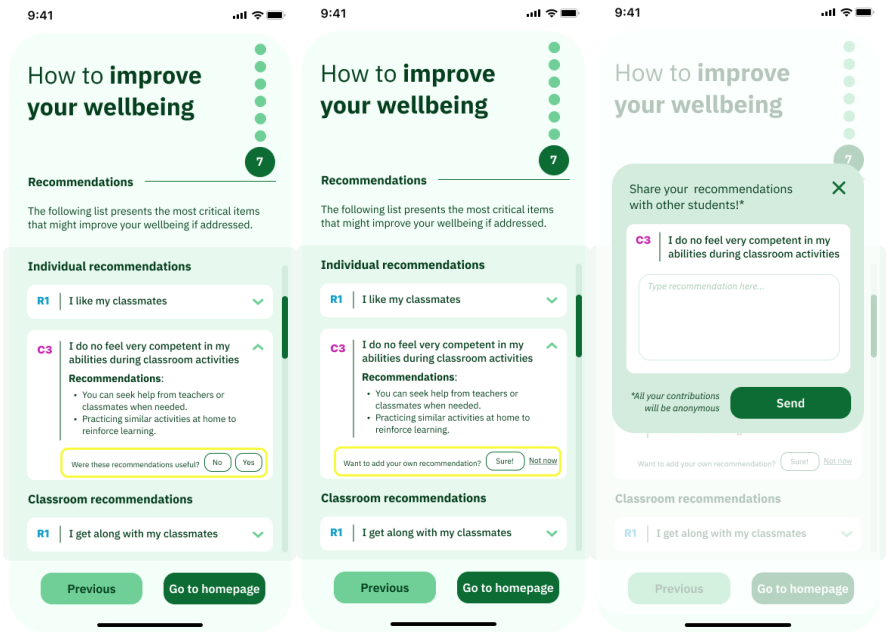

Figure 1e. Interaction 1 (highlighted in yellow) – Student feedback on recommendations usefulness; **Figure 1f.** Interaction 2 (highlighted in yellow) – Student prompting in sharing recommendations; **Figure 1g.** Interaction 3 – Pop-up to collect student feedback.

To address the improvements and feedback provided by students, Figures 1e, 1f, and 1g illustrate the author's proposed system for collecting student-generated recommendations. However, this process can be time-consuming due to the need for two filtering mechanisms: **1.Validation mechanism**: Student generated recommendations must undergo an initial validation process before being added to the repertoire, ensuring they do not contain harmful elements such as offensive language. And **2. Quality control**: The recommendations must also meet a quality standard, including at least one element that facilitates students' self-regulation. These two filters are essential for maintaining the integrity and effectiveness of the proposed system.

As an ongoing effort, we are exploring the integration of Generative Artificial Intelligence (GenAI) as a tool to enhance the process of reporting student-generated recommendations in ways that support self-regulation. The use of GenAI presents opportunities for automating and optimizing the recommendation system; however, careful consideration is needed to maintain ethical integrity. To mitigate potential ethical concerns—such as biases, misinterpretations, or the generation of harmful content—we emphasize the importance of human oversight throughout the process. Human intervention, particularly from educators and experienced students, serves as a safeguard against unintended negative consequences while ensuring the system remains aligned with pedagogical goals and ethical standards [e.g., 23, 24].

To facilitate self-regulation, we draw from the framework of Social-Emotional Learning (SEL), which encompasses five key competencies: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making [26]. These competencies not only support students in effectively engaging with recommendations but also serve as pathways to fulfilling the psychological needs outlined in SDT [25]. Through fostering autonomy, competence, and relatedness, SEL-aligned recommendations can contribute to meaningful learning experiences and personal development. Given these considerations, our research objective (RO) is as follows: **Exploring how to integrate GenAI into the recommendation system while maintaining ethical responsibility, ensuring recommendations align with SEL principles, and validating them through expert review (e.g., teachers, senior students).**

2. Open discussion

This paper is an open invitation to spark discussions around the two main topics addressed in this research so far, which can be summarized as follows: 1. The importance of LA addressing well-being data as an important and relevant factor in the development of students' learning outcomes. And 2. The potential of GenAI to support the creation of meaningful recommendations that facilitate self-regulation. Given the ethical complexities involved, expert validation—such as review by teachers or senior students—is essential to ensure the quality, appropriateness, and pedagogical value of these recommendations.

Both of these topics present a series of shared challenges to the human-centered community, such as addressing student well-being in LA through practices that are ethically sensitive in all stages of data collection, data analysis, data reporting and the subsequent well-being recommendations generated through such data.

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