

## INTRODUCTION

In early childhood contexts, **agency refers to the capacity to influence what and how students learn, closely linked to competence, autonomy, reflexivity, and purpose** (Varpanen, 2019; Pantić, 2017). Fostering this capacity has proven various benefits, such as heightened motivation, self-regulation, well-being, and participation in the classroom (Baker et al., 2023; Sirkko et al. 2019; Reunamo, 2007). Agency is described as a natural driver in humans (Shogren et al., 2017) according to the Self-Determination Theory (SDT) (Ryan & Deci, 2017). Specifically, the SDT connects this agentic ability to the Basic Psychological Needs (BPNs) (Shogren et al., 2015): autonomy, competence and relatedness. In the corpus of work by Wehmeyer (2004), when presenting the Causal Agency Theory, self-determined is described as “acting as the primary causal agent in one’s life and making choices and decisions regarding one’s quality of life free from undue external influence or interference” (Wehmeyer, 2004; Wehmeyer, 2001; Wehmeyer 1996). Meeting these basic needs fosters agentic potential by providing the essential scaffolding, namely the context and competencies required for agentic action.

**This work-in-progress examines how Generative Artificial Intelligence (GenAI) can be used, in the context of collaborative practices, to scaffold students’ agency through the lens of the SDT.**

This examination is done with the support of the Well-being Journey (WB Journey), which offers the necessary space to carry out such an SDT-based examination, with the integration of GenAI being a current work-in-progress. The **main objective** of this work is to explore how

providing personalized activities, designed with the support of GenAI to address students’ specific basic psychological needs (BPNs), can enhance their collaborative skills and sense of agency. This approach involves the following steps: First, an assessment of the students’ BPN satisfaction is conducted. For this specific work we make use of an adaptation of the Classroom Dynamics Questionnaire (Aadmi-Laamech et al., 2024) to evaluate the students’ BPNs. Subsequently, the WB Journey, with the support of GenAI, generates tailored activities that specifically target students’ unfulfilled needs (BPNs), creating the optimal context for agency to flourish. In this step, GenAI is used as a supporting tool to adapt already existing evidence-based recommendations within the WB Journey into an activity format. A number of group activities are generated for the most affected BPN items, from which teachers can choose depending on their students’ needs and behaviours. Such shared decision-making between the system and educators aligns with research showing that agency in educational technologies can be distributed across learners, teachers, and the system itself (Brod et al., 2023). This ensures two aspects: 1. Teachers become part of the AI-validation cycle, ensuring a Human-In-The-Loop (HITL) approach. And 2. Teachers are not restricted to a single set of activities; instead, they are given the freedom to select activities that better suit their students, while still remaining within the context of the affected BPNs. We are also exploring the possibility of giving teachers the ability to further edit/adapt the provided activities. Teachers can repeat this process as often as desired, provided they allow for sufficient buffer periods, as the WB Journey facilitates sustainable and longitudinal evaluation of BPN progress.

This also ensures that the scaffolding of agency is built on a cycle of continuous improvement (see Figure 1), mainly due to the targeted BPN activities (Figure 2). Ultimately, student agency is fostered by intentionally optimising environmental and psychological learning conditions, i.e. agency scaffolding.

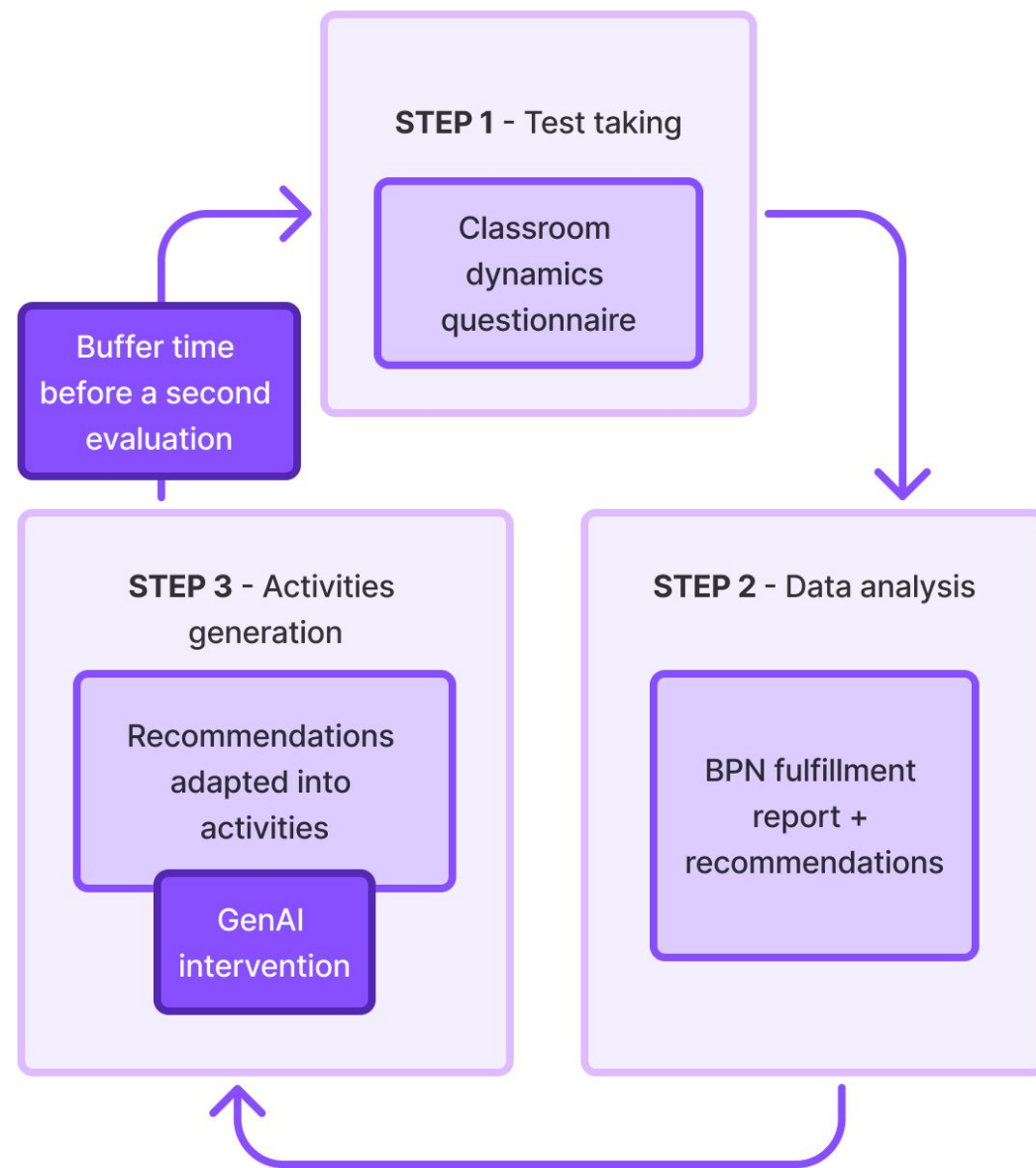


Figure 1 . Proposed sustainable cycle to scaffold student agency through the use of the WB Journey with the GenAI intervention.

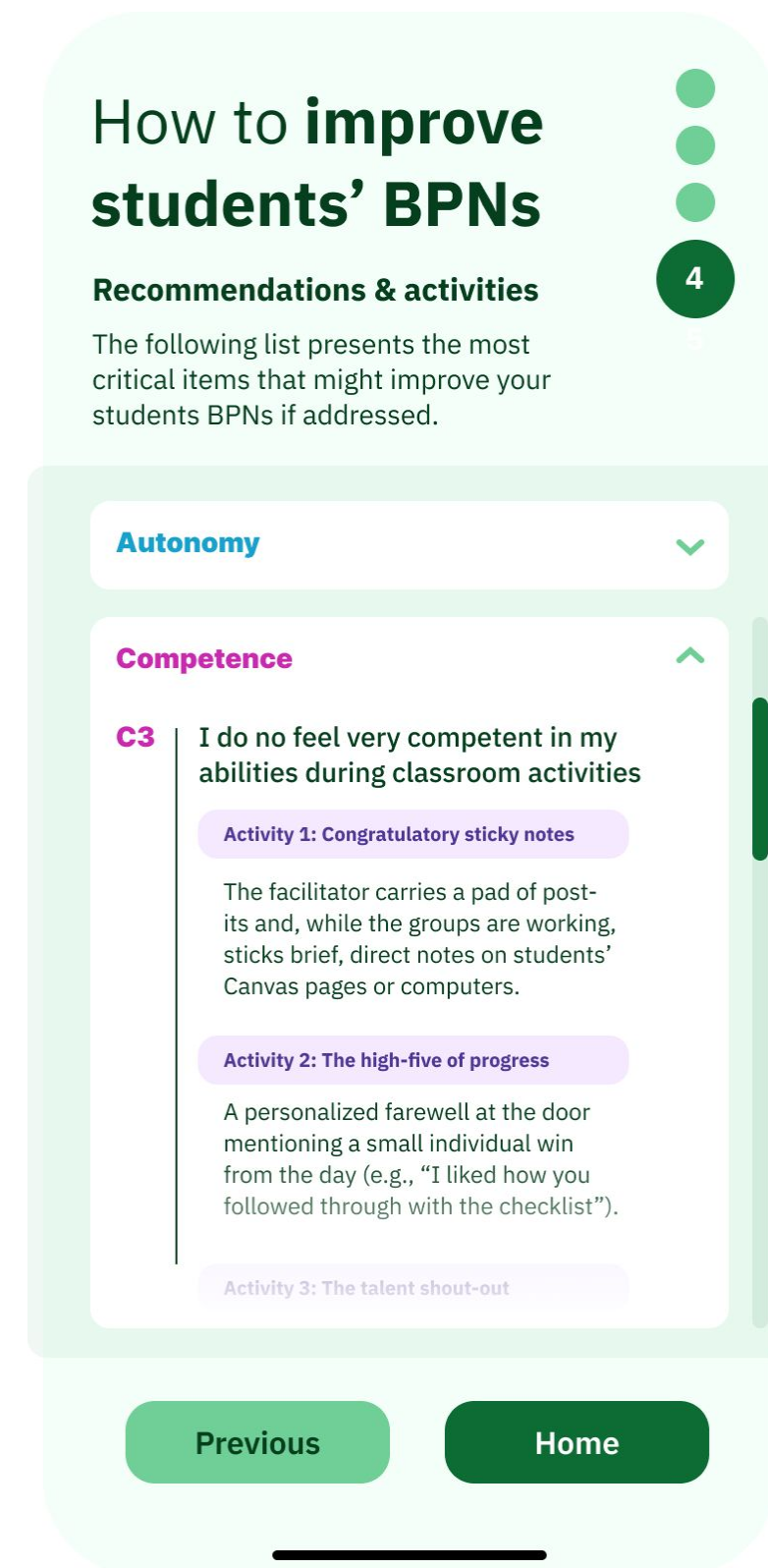


Figure 2. The WB Journey's proposed activities screen.

## METHODOLOGY

This work is conducted in the context of the Makers a les Aules project (Santos et al., 2025), an educational initiative carried out in primary schools in Barcelona, Spain. The project runs on a yearly basis, with six participating schools each season. The participating profiles are primary school students from 3rd grade (8-9 years old) to 6th grade (11-12 years old). The project offers a maker workshop divided in 5 sessions of 90 minutes each. During these sessions, students learn how to solve real-world problems through the lens of Design Thinking and the integration of maker technologies (i.e. Scratch, Makey Makey).

We evaluate students' engineering self-efficacy, social well-being and self-determination through a series of questionnaires spread out during the different sessions. In previous work under review, data about self-efficacy and well-being was collected and analyzed. Results indicated significant correlations between collaboration, self-efficacy and self-determination. In this work-in-progress, we propose collecting BPN data through the WB Journey, with GenAI integrated as a supportive tool to transform evidence-based recommendations into tailored activities. Teachers can then select from these activities to address students' reported unmet BPNs.

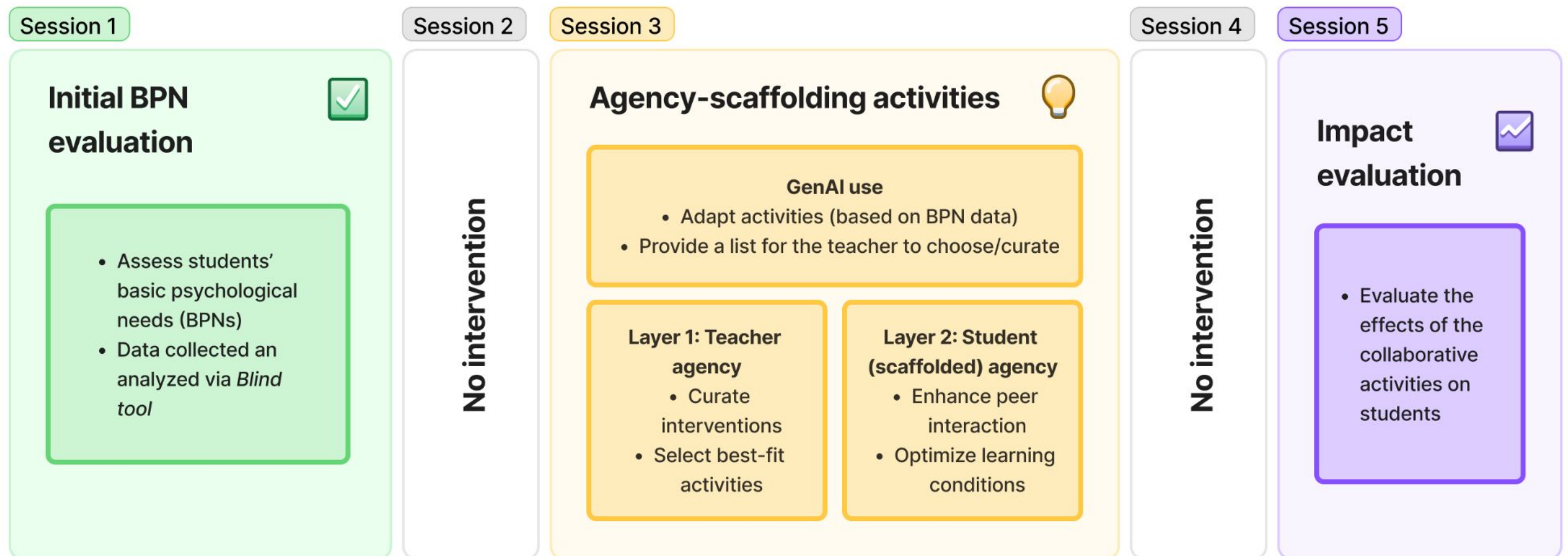


Figure 3. Interventions overview

In the context of the WB Journey project, which has 5 total sessions, the interventions done with the WB Journey are in three out of the five sessions (sessions 1, 3 and 5) (figure 3): Session 1 → A first evaluation of the students' BPNs is done, collecting the data in the tool. Session 3 → After analyzing the data of session 1, the activities are generated and given in the 3rd session, which with the help of GenAI are adapted into a series of activities, from which the teachers can choose to apply during class hours. Here, agency is scaffolded in two layers: Layer 1. Teachers curate interventions (aimed to improve collaboration among students) by choosing the activities most suited to their students' needs, while Layer 2. Students receive 'scaffolded agency' to overcome barriers to peer interaction, by optimizing their environmental and psychological learning conditions. Session 5 → The impact of such activities is evaluated again in the 5th session. As for the specific GenAI content generation, this is done following a series of steps for prompting, using Gemini 3 Pro model:

- **Context definition:** A detailed description of the context is provided to the AI model, including number of sessions, duration, and the activities that are to be carried out.
- **Role specification:** A series of roles and responsibilities are specified in the prompt, in which the intervening people are included: e.g. teachers, workshop facilitators and students (e.g. age).
- **Activity characteristics:** The activities to be generated were to be low cost (not many previous materials), of low duration (e.g. 5 minutes) and of high inclusivity.

The evaluation follows the five-session design. Students' BPNs are assessed using a pre-post approach, with baseline measurement in session 1 and a final assessment in session 5. The WB Journey system calculates

scores from the initial data (session 1) and generates tailored activities based on pre-established BPN recommendations (Aadmi-Laamech et al., 2024). These GenAI-generated activities are implemented in session 3. Their effectiveness is assessed separately from overall BPN progression through activity-level indicators such as student engagement and teachers qualitative feedback in a final interview.

## FUTURE WORK

We are exploring ways to actively involve students in the decision-making process of activity selection, which is currently led by teachers. The goal is to incorporate student input from the outset, enabling a more complete form of agentic scaffolding throughout the process. A second next step for this work-in-progress is to evaluate the functional integration of a GenAI model into the WB Journey, following the presented prompting. Further considerations also include discussions on data privacy and ethical aspects, and the impact of our work on them.

## ACKNOWLEDGEMENTS

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## USE OF LLMS STATEMENT

The use of Gemini 3 Pro was used to help structure the visual information of figure 3, while the final design is generated by the authors.

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