

Fostering Student Creativity: A Curriculum Proposal in the Context of “Innovation and Entrepreneurship” and “Double Reduction” Policies

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ABSTRACT

In today’s fast-paced society, innovation is the engine of progress, and education must evolve to foster creativity and practical skills in students. Traditional exam-focused systems hinder creativity while existing maker education inadequately nurtures innate creativity. The “Empathy Design Thinking” plan addresses these gaps by combining research and pedagogical methods, moving away from exams, and implementing diverse teaching strategies. It also focuses on equipping teachers with the right resources and training. To validate its effectiveness, a 12-week pilot will monitor 60 students, comparing their creativity before and after the program using the Williams Creativity Tendency Scale. Another group of 60 students will serve as a control for comparison. With institutional support from Beijing Normal University, the plan aims to not only enhance student creativity but also fine-tune the “Empathy Design Thinking” methodology for broader implementation.

Keywords: Creativity, Education, Innovation, Curriculum, Empathy design thinking

INTRODUCTION

Creativity is generally acknowledged to encompass two primary attributes: novelty and appropriateness. While some scholars view creativity as a psychological process, others emphasize it as an output. Sternberg et al. (1991) define creativity as “the ability to produce work that is both novel and appropriate”. Creativity is a critical indicator of innovative talent. In 2017, China’s Ministry of Education issued guidelines for comprehensive practical activities

in primary and secondary schools, highlighting problem-solving and materializing creativity as specific educational objectives at this stage (Pang & Plucker, 2012; Menéndez & Min, 2019; Loyalka et al., 2021).

In the current K-12 educational system, identifying problems and finding solutions are pivotal (Jia et al., 2017; Wang et al., 2023). The World Education Innovation Summit in 2016 released a report stating that “creativity and problem-solving abilities” are among the core competencies of future citizens. However, constraints such as exam-oriented education, the conventional approach of existing maker education, and the need for qualified instructors and appropriate tools hinder students’ practical cultivation of creativity and innovation.

To address these issues, the “Empathy Design Thinking” course integrates design, computational, engineering, and business thinking to promote empathy, collaboration, expression, and practical skills among students (Niemi & Liu, 2021; Liu et al., 2021). Grounded in the context of Chinese education and drawing on advanced practices in educational reform, this study aims to steer Chinese students towards a learning model focused on problem identification, conflict resolution, and future innovation, realized through dynamic learning methodologies (Qiu et al., 2022; Desmet et al., 2023). This approach offers novel perspectives on the curricular system and educational reform in China’s primary and secondary schools.

Fostering Creativity in Primary and Secondary Students

Children, as the nation’s future, represent a crucial demographic for national progress. Prioritizing child development is fundamental to enhancing the quality of the populace. This project is rooted in Chinese education and caters to the developmental characteristics of children aged 6-12. It incorporates global best practices in educational reform and employs an engaging, exploratory learning approach. This approach helps translate “design thinking” into actionable steps, fostering students’ innovative mindset and enhancing their empathy, collaboration, and practical skills (van Doorn et al., 2013). The project thus addresses diverse educational needs, optimizes in-class and out-of-class educational structures, and elevates core competencies. It also strongly supplements school extracurricular activities, especially within the “Innovation and Entrepreneurship” and “Double Reduction” policies.

Conceptual Framework of the Course

On the one hand, students approach theoretical learning with keen interest, providing a cognitive foundation for hands-on activities. On the other hand, practical exercises offer experiential and interactive opportunities that stimulate mental growth, broaden subject knowledge, and encourage divergent thinking. Design thinking theory is instrumental for the project for several reasons (Dym et al., 2005; Ohashi et al., 2022). Firstly, it begins with real-world problems, emphasizing creative problem-solving and practical visualization of solutions. Secondly, its human-centric approach elevates the role of the learner, offering more intellectual and educational space, thereby strongly supporting creativity development.

Significance of Offering the Course

Creativity is critical to a child's lifelong development, especially during primary and secondary education, which is considered a golden period for cultivating creativity. Enhancing children's creativity also impacts the progress and well-being of society at large and is strategically essential for elevating the quality of the Chinese populace and nation-building (Zhang et al., 2019). This project aims to foster creativity through empathy—one of the crucial skills for the 21st century—benefiting students' long-term development and inner happiness. We plan to continually optimize methods for fostering empathy and offer training for other teachers, allowing them to integrate these techniques into their courses. The aim is to provide more opportunities for enhancing empathy among primary and secondary students, with a yearly training target of 30 students.

COURSE PLAN

Theme and Scope

To validate the effectiveness of the course, we plan to conduct an experimental study in primary and secondary schools, enrolling 60 students as the test group. These participants will be divided into eight sub-groups for a 12-week hands-on course. Creativity assessments will be conducted before and after the course, along with the collection of survey questionnaires from both students and parents. Concurrently, we will enrol another 60 students as a control group who will not participate in the course but will undergo the same creativity assessments. The impact of the course on student creativity will be evaluated using the Williams Creative Tendency Scale (Davis, 1989; Huang et al., 2021).

Timeline (See Table 1)

The project will span two years and be conducted in two phases.

- Phase One (June 1, 2023 - May 30, 2024): Initial development of the curriculum will focus on the cognitive and emotional development characteristics of primary school students, considering societal changes and developmental requirements. The course will be pilot-tested in 5–8 schools with diverse educational environments. Following this, 30 students will be enrolled for a pilot study, divided into experimental and control groups. They will undergo pre- and post-creativity tests and participate in surveys. After the initial pilot, we plan to enroll 60 students for the main study to validate the program's effectiveness further. Data collection and analysis in this expanded phase will be crucial, serving as the foundation for targeted improvements and refinements in the curriculum for subsequent implementations.
- Phase Two (June 1, 2024 - May 30, 2025): Analytical assessment of collected data will occur, followed by the publication of research papers. We plan to recruit 15–30 teachers nationwide for the first “Empathy Design Thinking” course and teacher training program. The course will be integrated into Beijing Normal University's teacher-oriented projects

and offered as professional development for graduates. To expand the reach of the project, a series of videos documenting the experimental process, implementation plans, student work showcase, and curriculum evaluations will be produced.

The project intends to initiate a trial of the “Empathy Design Thinking” course in 5–8 schools in Beijing and Wujiang District in Suzhou. A standardized curriculum and teaching materials will be developed following the trial for broader application. The course seeks to improve students’ creative and problem-solving abilities, contributing to nationwide innovation and technological advancement (Lumsdaine & Lumsdaine, 1994).

Table 1. The detailed timeline.

Time span	Work content
2023.06-07	Design the course themes, content, supplementary toolkits, and teaching methods, considering the psychological and physical development of primary school students in China, contemporary societal changes, and developmental requirements while ensuring meaningfulness and engagement.
2023.07-08	Recruit 30 students to serve as the experimental group, divided into 2 sub-groups for two phases of course implementation. Conduct pre- and post-course creativity assessments and collect survey data from students and parents.
2023.09-12	Enlist 60 students to form the experimental group, divided into 8 sub-groups for a 12-week course implementation. Perform pre- and post-course assessments on students’ creativity and collect survey data from students and parents.
2024.01-05	Compile results, publish academic papers, and release educational materials.
2024.06-07	Analyze and summarize experimental data, collect feedback from students and parents, and compile the project outcomes. Publish related academic papers. Provide a clear, accurate, and detailed description of experimental design, data analysis, and conclusions.
2024.08-10	Recruit 15–30 teachers nationwide from primary and secondary schools for the first phase of the “Empathetic Design Thinking” teacher training program.
2024.11-12	Collaborate with Beijing Normal University’s “Plan to Strengthen Basic Education Teacher Force” and the “Targeted Teacher Training Plan” at Beijing Normal University Zhuhai campus to train teachers to cultivate student empathy.
2025.01-05	Disseminate the project’s achievements via video format to benefit primary and secondary school students in more regions.

SUSTAINABILITY AND SCALABILITY

Upon the project’s completion, we intend to extend its successes and insights through a range of practical measures aimed at national dissemination, benefiting both primary and secondary school students, as well as their families. These specific strategies include:

- **Teacher Training:** Leveraging the accumulated experience and outcomes, we will design and iterate training courses. Annually, we will assist partnering institutions in cultivating teachers with relevant skills, facilitating

the ongoing dissemination of these courses within their schools to benefit a broader student population.

- **Cultivating Empathy:** This project has demonstrated significant efficacy in fostering student empathy. Participants are expected to continue growing their empathy skills in their educational journey, thereby assisting their peers in enhancing empathy through interpersonal communication.
- **Collaboration with Schools:** Utilizing the platform of our collaborating institutions, we aim to extend our reach to fifth and sixth graders in primary and secondary schools nationwide. Our mature curriculum and teacher training system will be implemented in more educational settings.
- **Online Video Content:** We plan to produce segmented videos of specific course components, making them available on online video platforms. This will facilitate the involvement of schools and students lacking hands-on implementation resources.
- **Publication Partnerships:** Collaborating with publishing entities, we will generate relevant educational tools and scholarly papers to achieve a continuous impact through published works.
- **Transdisciplinary Integration:** We will encourage teachers from various disciplines to incorporate the principles of empathy cultivation into their subject matter, thus generating a set of innovative courses.

Through the execution of these strategies, we aim to sustain the project's impact over the long term, affecting both schools and students continuously. This will, in turn, contribute further to enhancing students' creativity.

CONCLUSION

In the context of educational design and curriculum implementation in China, the importance of fostering creativity among primary and secondary school students is increasingly recognized. This project, situated within China's unique educational landscape, integrates the physiological and psychological developmental traits of children aged 6–12 with advanced international practices in educational reform. Through the implementation of the “Empathy Design Thinking” course, the initiative successfully transitions students from “design thinking” to “design doing” (Norman, 2023). This not only enhances the students' skills in empathy, collaboration, expression, and practicality but also accommodates their diverse educational needs. As a result, the project offers a richer conceptual framework and experimental methodologies for cultivating creativity among primary and secondary school students. This aligns well with the philosophy that success in life is less about the assets or knowledge one accumulates but more about how one leverages these resources to make meaningful contributions to society, as articulated by Cyrus Tang.

ETHICS STATEMENT

The course presented in this paper was conducted according to the guidelines of the Declaration of Helsinki and approved by the Ethics Committee of Beijing Normal University. Written informed consent for reporting student work examples will be obtained from all participants involved in the course.

DECLARATION OF COMPETING INTEREST

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Wei Liu reports financial support was provided by Cyrus Tang Foundation.

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