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## MUBABAO: BRIDGING THE GAP BETWEEN HUMAN AND ARTIFICIAL INTELLIGENCE

### INTRODUCTION

We are moving into a new era of digital technology, with the rapid rise of artificial intelligence and robotics. Artificial intelligence (AI) may be defined as technology capable of carrying out tasks that would otherwise need human intelligence (CHUKLIN ET AL. 2018). AI-powered devices have the capacity to perform tasks more affordably, tirelessly, efficiently, and with reduced errors when compared to human labor. The advent of tools like ChatGPT, which can be utilized for tasks such as coding, essay writing, composing song lyrics, and crafting resumes, has redefined the professional landscape, prompting concerns about human obsolescence. In this ever-evolving era influenced by the Fourth Industrial Revolution, it becomes crucial to nurture distinctive human qualities that distinguish us from machines (PRISECARU 2016; NEWTON and NEWTON 2020). This is particularly relevant in the field of education, as it is essential for students to be equipped to address societal needs and compensate for the limitations of AI. In his book *Robot-Proof: Higher Education in the Age of Artificial Intelligence*, Aoun raises the question of how higher education institutions can adequately equip students for their future careers in this dynamic environment.<sup>4</sup> He explores the need for educational systems to go beyond conventional knowledge-based learning and focus on nurturing skills and attributes that make indi-

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viduals adaptable and resilient in the face of AI-driven changes in the job market (AOUN 2017; SELDON and ADIBOYE 2018). Critical thinking, creativity and emotional intelligence stand at the forefront of these unique attributes. Problem solving skills, the ability to dynamically adapt to variable situations, flexibility and innovative thinking are not an advantage, but rather a necessity to survive in this digital age. There is an increasingly high demand for the educational systems to introduce innovative and out-of-the-box learning methods to complement technical knowledge and better equip students for future careers in this evolving landscape.

The MuBaBaO Creative Thinking Blocks<sup>1</sup> represent an inventive educational tool that is specially designed to meet the changing landscape shaped by the rise of AI. The MuBaBaO approach bolsters critical thinking, creativity, and emotional intelligence through nurturing cognitive engagement. It fosters skills and ideas using a nonlinear pedagogy approach, departing from traditional instructional methods. These blocks employ a visual-storytelling learning approach aimed at fostering creative thinking, spatial intelligence, and effective communication by engaging participants in a dynamic and multi-layered exercise. These wooden blocks, of varying shapes, sizes, and patterns, can be joined in multiple ways to create different types of objects serving as catalysts for building spatial and emotional intelligence and encouraging participants to indulge in open-ended, exploratory play. This immersive and multidimensional method empowers learners to flourish amidst technological advancement, addressing the key limitations of AI.

#### THE MUBABAO METHOD

Each MuBaBaO box contains small wooden blocks (like Lego blocks but made of wood) of different shapes and sizes. Each box represents chaos, and the primary goal of the MuBaBaO method is to make sense out of the chaos. The participants are divided into different groups and each group is presented with a box of wooden blocks. Participants are then tasked with creatively connecting the blocks and creating something out of them that could be part of a solution to a given problem. Finally, they are then required to tell a story about what they have created and how this would solve the problem. The rationale behind the MuBaBaO method is simple and effective—to train par-

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<sup>1</sup> The blocks were invented by Michał Malinowski of the Muzeum Bajek, Baśni i Opowieści—Storyteller Museum, Poland.

ticipants to deal with complicated challenges on the spur of the moment. The chaotic arrangement of the blocks emulates the unpredictability and complexity of real-life scenarios. The challenge lies in the variety of block shapes. Some blocks fit together, while others do not, requiring participants to discern which parts can connect. This method highlights the transformative power of creative thinking by exploring unconventional connections, experimenting with different arrangements, and using imagination as a guiding force. The storytelling aspect fosters out-of-the-box thinking, imagination and develops emotional intelligence, helping in building something meaningful out of chaos and entropy.

#### THE MUBABAO LEARNING MODEL

The MuBaBaO learning model aims at developing an eco-system of learning where creative abilities are harnessed in a functional and constructive environment. The MuBaBaO learning model uses the three-pronged learning approach of promoting nonlinear pedagogy, fostering freedom of action, and cultivating cognitive engagement.

##### PROMOTING NONLINEAR PEDAGOGY

Nonlinear pedagogy is an approach that focuses on learning movement skills through exploration and personalized development. Such an approach focuses on developing individualized movement and advancing exploratory behaviors in children (CHOW, KOMAR, and SEIFERT 2021). Nonlinear pedagogy has been referenced in different studies, especially in the fields of sports, where adapting your movement in dynamic situations helps in training your perception (CHOW, KOMAR, and SEIFERT 2021; CORREIA ET AL. 2019; CHOW 2011). An example would be in the sport of climbing, where learned intelligence in movement is a key factor establishing a success rate. In such cases memory functions and builds by imagining scenarios and learning from failed outcomes. Similarly, MuBaBaO is designed to contribute to the evolution of movement behaviors and develop physical literacy in a non-linear fashion. Using the blocks involves a trying-and-testing approach towards building structures, developing perception, and contributing to learned intelligence. It breaks free from conventional instructional approaches and lets the participants design and direct their movement in achieving

success in their forms of creation. Physical memory plays an important role as each failed endeavor registers into the motion centers of the brain and muscles, adapting perception and directing participants towards alternative strategies to accomplish the task. Stepping aside from traditional teaching methods, MuBaBaO empowers learners to explore, experiment, and construct in a self-directed manner. It enables individuals to unearth their distinctive cognitive processes and problem-solving strategies through adaptive techniques.

#### FOSTERING FREEDOM OF ACTION

A significantly important objective of the MuBaBaO blocks is to foster freedom of expression and action. Learning systems have an important role in constructing and conducting activities that create a freedom to learn. Self-expression and uniqueness are critical in this day and age to empower students and assist in developing their distinct personality. Fostering freedom of action contributes towards self-leadership, exercising the ability to influence and direct one's thoughts and actions to successfully reach goals. Self-leadership is an important aspect of educational attainment in higher institutions (NAPIERSKY and WOODS 2018). Furthermore, the blocks promote autonomous decision-making skills which are required in determining the outcome of the creative process. The created structures also instill a sense of ownership in the participants, fueling their self-confidence and ability to express. Since the blocks are visual, free from the barriers of language, they make self-expression and communication simpler and more effective. They have more potential to reach students with different learning styles and capabilities and can successfully build a diverse and inclusive ecological habitat in learning institutions, strengthening core principles of unity in diversity. Each block is a canvas for imagination, enabling individuals to envision, design, and construct without predefined limitations. With the surplus of prescriptive knowledge-based learning systems, cultivating an environment free from the restrictions of the traditional teaching methods nurtures independent thinking and sharpens skills required for meeting the challenges of the future.

## CULTIVATING COGNITIVE ENGAGEMENT

The MuBaBaO blocks serve as dynamic catalysts for cognitive engagement, offering a transformative platform for learners of different ages to explore, experiment, and create.

MuBaBaO play cultivates cognitive engagement by a variety of techniques. Since the blocks engage multiple senses of sight, touch, and spatial awareness, the creative process becomes a multi-sensory experience stimulating different regions of the brain, enhancing cognitive centers and memory retention. It also enhances the skills required for problem-solving and spatial reasoning by challenging areas in the brain to analyze, plan, and execute solutions. The MuBaBaO method unlocks both divergent and convergent thinking by generating multiple ideas and possibilities (divergent) and then streamlining them into a cohesive structure (convergent). This process enables participants to utilize cognitive flexibility, creativity and boost critical thinking. MuBaBaO blocks employ the same foundational framework of puzzle-solving by recognizing patterns, arranging shapes, and establishing logical sequences. This process engages the brain's pattern recognition abilities, promoting cognitive organization and analytical thinking. Each block is a blank canvas for imagination. Learners must visualize their desired structure and then translate that mental image into a tangible creation. This mental exercise strengthens cognitive abilities related to spatial visualization. During the building process, learners receive immediate feedback, which facilitates positive reinforcement of learning and encourages flexible thinking. Depending on how different block configurations interact, the participants can modify and adjust anytime in the middle or at the end of the creative process. The modification can be applied in either building growing sculpture or disassembling parts to restart the creation process helping in acquiring skills of adaptability. The whole method requires learners to plan, organize, and execute their designs which engages the executive functions of the brain, including attention control, working memory, and inhibitory control. Engaging with MuBaBaO blocks stimulates creativity and encourages learners to think outside conventional boundaries, fostering innovation. The open-ended nature of MuBaBaO play encourages intrinsic motivation. When learners are intrinsically motivated, they enter a state of flow—a mental state characterized by complete absorption and focus. The storytelling element in the MuBaBaO system sharpens emotional intelligence, which is a highly desired quality in professional and interpersonal domains.

## DISCUSSION

According to the American Psychological Association, human intelligence is the mental capacity to plan, reason, solve problems, learn from experience, think abstractly, and comprehend complex ideas (FREDERIKSEN 1986). It is not just book learning, a narrow academic skill, or a test-taking ability. Rather, it reflects a broader and deeper capability for comprehending our surroundings—“making sense” of things, or “figuring out” what to do. Human intelligence isn’t static, but one that varies according to changing circumstances and conditions. Artificial intelligence closely mimics human intelligence, demonstrating cognitive abilities, learning, adaptability, and decision-making as it continues to evolve. Educational institutions are using AI as an important tool for learning in classrooms (CHEN, CHEN, and LIN 2020). However, there are significant limitations to artificial intelligence, such as repeatedly failing the controversial Turing Test, which questions machines’ ability to truly think (OPPY and DOWE, 2003). Recent studies indicate ChatGPT came close to passing versions of the Turing Test but failed to solve simple visual puzzles in the form of ConceptARC tests (BIEVER 2023). Scientists have been divided on whether machines can think and reason, and these logical puzzles and visual tests highlight significant differences between the capabilities of humans and AI. The MuBaBaO blocks bridge a significant gap between human and AI through their creativity and cognitive engagement. Using a non-linear pedagogical approach, they work towards building a learner-friendly environmental design to help the learner acquire skills. They promote creativity and strengthen critical thinking, creativity, emotional intelligence, and innovation. The blocks also work on the same principles of artificial intelligence and machine learning, using mechanisms such as pattern recognition and adaptability to different tasks and data. The overlap between AI and human intelligence makes MuBaBaO blocks a unique and effective learning system desired in educational institutions.

## FUTURE IMPLICATIONS

Incorporating the MuBaBaO approach into educational curricula in educational institutions would empower learners to flourish amidst technological advancement. They would help learners gain proficiency in essential cognitive skills and cultivate a growth mindset, instilling a sense of owner-

ship over their learning journey. The blocks would also contribute to the development and practice of foundational creativity, cognitive thinking, and critical thinking skills. They could pave way for interdepartmental collaboration and have applications in different departments—arts, humanities, social, business studies, and health sciences. It could pave way for future research and innovative methods of learning in a tech-dominated atmosphere. The MuBaBaO blocks also offer an opportunity for international partnerships with different regions and sectors on a global level.

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MUBABAO: BRIDGING THE GAP  
BETWEEN HUMAN AND ARTIFICIAL INTELLIGENCE

Summary

This paper explores the applications of MuBaBaO Creative Thinking Blocks as an educational tool in the artificial intelligence-driven era. The multidimensional MuBaBaO method diverges from traditional learning methods and emphasizes fostering critical thinking, effective communication, creativity, spatial and emotional intelligence through non-linear pedagogy. By engaging participants in creative and problem-solving tasks using wooden blocks, this dynamic exploratory approach enhances cognitive abilities and prepares students to thrive alongside AI advancements. The paper highlights the importance of developing distinctive human qualities and skills, such as adaptability, imagination, and innovative thinking, to complement the technical knowledge required in a technology-dominated landscape.

**Keywords:** MuBaBaO; artificial intelligence; creativity; non-linear pedagogy; cognitive engagement; emotional intelligence

MUBABAO: ZMNIEJSZANIE DYSTANSU  
MIĘDZY LUDZKĄ A SZTUCZNĄ INTELIGENCJĄ

Streszczenie

Autorka bada zastosowanie kreatywnych klocków MuBaBaO jako narzędzia edukacyjnego w erze sztucznej inteligencji. Wielowymiarowa metoda MuBaBaO odchodzi od tradycyjnych metod nauczania, kładąc nacisk na krytyczne myślenie, skuteczną komunikację, kreatywność, inteligencję przestrzenną i emocjonalną dzięki zastosowaniu pedagogiki nieliniowej. Takie dynamiczne podejście eksploracyjne, dzięki zaangażowaniu uczestników w kreatywne zadania i rozwiązywanie problemów przy użyciu drewnianych klocków, zwiększa ich zdolności poznawcze i ułatwia im rozwój przy wsparciu sztucznej inteligencji. Autorka podkreśla znaczenie rozwijania wyłącznie ludzkich cech i umiejętności, takich jak zdolność adaptacji, wyobraźnia i innowacyjne myślenie, w celu uzupełnienia wiedzy technicznej wymaganej w otoczeniu zdominowanym przez technologię.

**Słowa kluczowe:** MuBaBaO; sztuczna inteligencja; kreatywność; pedagogika nieliniowa; zaangażowanie poznawcze; inteligencja emocjonalna