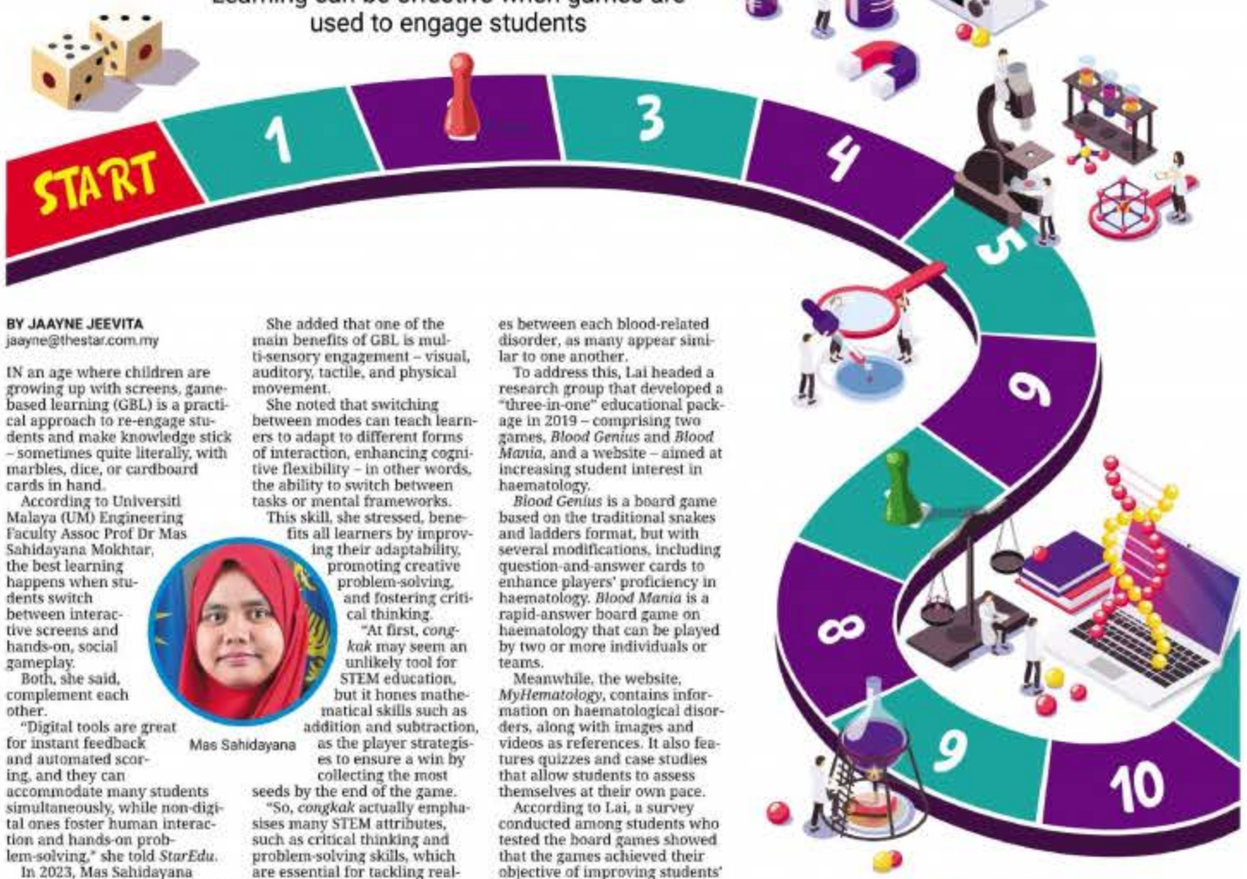
Not just child's play

Learning can be effective when games are used to engage students



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IN an age where children are growing up with screens, game-based learning (GBL) is a practical approach to re-engage students and make knowledge stick – sometimes quite literally, with marbles, dice, or cardboard cards in hand.

According to Universiti Malaya (UM) Engineering Faculty Assoc Prof Dr Mas Sahidayana Mokhtar, the best learning happens when students switch between interactive screens and hands-on, social gameplay.

Mas Sahidayana

Both, she said, complement each other.

"Digital tools are great for instant feedback and automated scoring, and they can accommodate many students simultaneously, while non-digital ones foster human interaction and hands-on problem-solving," she told *StarEdu*.

In 2023, Mas Sahidayana spearheaded a project involving UM, Cardiff Metropolitan University and Eureka Robotics Centre. The initiative introduced the concept of science, technology, engineering and mathematics (STEM) through the traditional game of *congkak*, as part of a collaborative Partnership in Employability (PIE) programme for women. The project aimed to nurture robotics research and promote science, technology, engineering, arts, mathematics, and health (STEAM-H) knowledge exchange between PIE partners in Asean and the United Kingdom.

Mas Sahidayana – who led an activity session with 28 girls aged 10 to 12 – said the "STEM Through Traditional *Congkak* Game" project creatively connects STEM education, especially mathematics, with Malaysia's classic *congkak* game.

The aim, she explained, is to make learning more enjoyable while encouraging students to reconnect with a traditional pastime that is no longer widely played among younger generations.

She added that one of the main benefits of GBL is multi-sensory engagement – visual, auditory, tactile, and physical movement.

She noted that switching between modes can teach learners to adapt to different forms of interaction, enhancing cognitive flexibility – in other words, the ability to switch between tasks or mental frameworks.

This skill, she stressed, benefits all learners by improving their adaptability, promoting creative problem-solving, and fostering critical thinking.

"At first, *congkak* may seem an unlikely tool for STEM education, but it hones mathematical skills such as addition and subtraction, as the player strategises to ensure a win by collecting the most seeds by the end of the game.

"So, *congkak* actually emphasises many STEM attributes, such as critical thinking and problem-solving skills, which are essential for tackling real-world problems," said Mas Sahidayana, who showcased her project at the Putrajaya Festival of Ideas in November last year.

Fun meets theory

GBL is also being integrated at the tertiary level in specialised subjects like haematology – the study of blood-related disorders.

Universiti Putra Malaysia (UPM) Medicine and Health Sciences Faculty Assoc Prof Dr Lai Mei I said a tactile, game-based approach works particularly well for the subject, typically seen as heavy and theory-laden.


Lai

"As different individuals have different learning styles, using varied mediums to approach a subject allows students to retain information better by engaging multiple senses, learning modes and repeated recall," she said.

She added that in haematology, it can be difficult for students to grasp the key differences between each blood-related disorder, as many appear similar to one another.

To address this, Lai headed a research group that developed a "three-in-one" educational package in 2019 – comprising two games, *Blood Genius* and *Blood Mania*, and a website – aimed at increasing student interest in haematology.

Blood Genius is a board game based on the traditional snakes and ladders format, but with several modifications, including question-and-answer cards to enhance players' proficiency in haematology. *Blood Mania* is a rapid-answer board game on haematology that can be played by two or more individuals or teams.

Meanwhile, the website, *MyHematology*, contains information on haematological disorders, along with images and videos as references. It also features quizzes and case studies that allow students to assess themselves at their own pace.

According to Lai, a survey conducted among students who tested the board games showed that the games achieved their objective of improving students' proficiency in the subject.

The survey respondents agreed that *Blood Genius*, in particular – which accommodates both traditional and digital learning styles – promotes self-learning and peer learning through discussions.

"Using this game as a base brings back the familiarity of fun that many lose when they become adults.

"While students play using physical boards, they are encouraged to look up information online, creating a hybrid experience that supports both knowledge recall and modern research skills.

"This integration allows them to benefit from the best of both worlds," she said.

"The game-based approach introduces an element of fun while learning a particular subject, and when something is fun, we will enjoy learning the subject more.

"It also allows for friendly competition, where we can 'show off' to our friends how much we know," she added.


Camelia

Skills beyond books

Students who played the haematology board games, said Lai, enjoyed having a break from academic-focused learning and found themselves indirectly picking up collaborative and soft skills.

"Being a doctor is never about working in silos.

"In the real clinical world, doctors are always consulting with each other when it comes to complex cases and we are just fostering those social skills through playing hands-on games.

"GBL, like our board games, allows them to discuss, share and teach each other if anyone is stuck at any of the questions.

"They are still learning about the subject, but in a fun and engaging way," she said.

Echoing this, Taylor's University Innovation and Technology Faculty Assoc Prof Dr Camelia May Li Kusumo said non-digital games support the development of social and emotional skills through tactile, face-to-face interaction while digital games tend to enhance academic and cognitive skills.

She emphasised that both forms play an important role in GBL, which offers emotional and physical dimensions crucial for building emotional intelligence and social skills – especially in an age dominated by online gaming.

"These social skills include collaboration through turn-taking, patience, listening, and respecting others," she said.

Camelia, who developed an educational board game alongside Taylor's University senior lecturer Dr Lee Sze-Ee and board game enthusiast Goh Choon Ean, has been using GBL to connect younger generations to Malaysian culture and architecture.

The game, *Kaki Lima: Downtown KL*, she said, introduces players to the cultural significance of the five-foot way (*kaki lima*), a common but often overlooked architectural feature in Malaysian shophouses.

Kaki Lima: Downtown KL draws inspiration directly from the book *Kaki Lima Stories: Life in the Five-Foot Ways in Downtown Kuala Lumpur*, a book co-authored by Camelia and Lee, which presents 31 real-life stories capturing the diversity and essence of daily life in these covered walkways.

Designed as both an educational and cultural tool, the board game allows players to immerse themselves in the heritage-rich environment of KL while developing critical thinking and social interaction skills.

"The game introduces the concept of 'sticky activity', which are activities that encourage people to stay and linger in a public space.

"The game's mechanics encourage players to walk, create and appreciate these sticky activities on the five-foot way, while also rewarding collaboration and togetherness.

"It also helps introduce Malaysian intangible heritage to players," she said, adding that it promotes intergenerational learning and experiences that build trust and relationships.

She emphasised that games like *Kaki Lima* are not just about heritage for heritage's sake – they're tools for critical, relevant education.

"Students often perceive learning history and heritage as boring.

"GBL can complement formal curricula through teaching and learning pedagogy by allowing students to learn actively rather than passively.

"Learning through play activates multiple senses and provides context, which aids in long-term retention," she said.

Livening up lessons

If textbooks were passports, then board games would be secret doorways to places we never knew we could reach – unexpected, playful, and surprisingly powerful. When it comes to learning tricky subjects like maths, science or history, redesigned board games can do more than entertain – they can transform how we connect with knowledge. Imagine solving equations not for marks, but to escape a trap in a dungeon. Or building atoms and molecules as part of a race to save a fictional planet. These games often involve eye contact, conversation, negotiation – all of which make learning feel real and memorable. You don't just play alone behind a screen; you argue, strategise and collaborate in a shared space. That sense of connection, of slowing down and engaging all your senses, is something digital games often struggle to recreate. That said, digital games still have their strengths. They offer speed, instant feedback and flexible access, making them great for revision or testing quick recall. But they often lean towards individual performance, quick clicks, and surface-level interaction. While both digital and non-digital games can support learning, the key difference lies in depth and connection. In the end, learning shouldn't only be measured by speed or scores. It should be about memory, meaning, and maybe a little bit of magic.

Isabel Lim, 14

The gamification of difficult subjects, whether digital or non-digital, is a great way to get students to engage more passionately with a subject, especially in the early stages of learning. These games help leave a better impression of what are now commonly assumed to be intimidating subjects, using simple and attractive concepts to boost one's understanding of a subject. Nonetheless, when comparing digital and non-digital games, the non-digital games have more to offer. I'll admit that digital games are more accessible and convenient, in the sense that it would be much easier for me to go online and play a few rounds of Quizizz with a few clicks of a button than it would be to gather a few people for a game of Scrabble. These digital games are also effective when it comes to individualised learning. However, non-digital games offer a more mentally stimulating and interactive environment. They not only minimise online distractions, but also encourage players to communicate and brainstorm directly with teammates, all while thinking on their feet.

Thanushree Thirugana Kumeren, 17

Adopting classic board games like Scrabble, Happy Families, or Snakes and Ladders as educational tools can be both exciting and useful – especially for tough subjects like history, science or maths. I remember once playing Scrabble with names of historical figures, and although it was quite tricky, it turned out to be a blast. We laughed a lot, and at the same time, we had to really think about what we'd learnt in class. Board games offer a kind of hands-on learning that's more lively and personal. They encourage direct interaction and spark spontaneous discussions, which can make lessons stick better. On the other hand, online games like Quizizz or Kahoot are super convenient. You can join in from anywhere, which makes them perfect for group study when everyone's in a different place. Plus, the visuals and instant feedback keep things fast and dynamic. Both styles offer different advantages. Mixing them up could make learning feel less like a task and more like an adventure.

Fiona Flonika Joshman, 22

Sticky offline gains

THE key to learning is that one should still be able to function even without technology, says Universiti Putra Malaysia (UPM) Medicine and Health Sciences Faculty Assoc Prof Dr Lai Mei I.

Noting that critical thinking is cultivated through problem-solving, she said direct access to immediate answers often hampers this development.

"Allowing delayed gratification in terms of getting answers forces students to actively learn a particular topic.

"With the ease of ChatGPT these days, many students may just search for answers online without thinking," she said.

She also stressed that relational and communication skills can only be developed through real-life interaction.

"The ability to notice subtle cues and body language – particularly crucial for future healthcare professionals – cannot be learnt through screens.

"Thus, non-digital learning methods, whether through educational games or physical classroom activities, still play a vital role in shaping competent, empathetic medical practitioners," she said.

A believer in the efficacy of play, she said it builds relationships, nurtures problem-solving abilities, and enhances critical thinking.

"In this era, everyone is programmed to be busy, but we forget the value of play," she noted.

She also expressed concern that the decline in play-based learning might be linked to broader societal issues such as loneliness and reduced creativity.

She added that for students in low-resource settings, non-digital games provide more opportunities for students to memorise key information better.

"It fosters long-term retention and communication.

"Students will be more confident of their answers because they must remember them and not have to pull out their phones every time they are asked a question," she said.

"Learning does not stop just because we are disconnected from the outside world," she concluded. – By JAAYNE JEEVITA