QUALITATIVE RESEARCH

The Use of Building Blocks to Teach Communication and Social Skills to First-year Pharmacy Students

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Objective. To conduct an innovative workshop activity using plastic building blocks to create a student-centric environment that encouraged development of creative thinking skills and self-reflection in undergraduate pharmacy students.

Methods. Students were randomly allocated into small groups of four and assigned the role of either architect or team builder and tasked with creating a LEGO robot. Students were not allowed to speak during the activity. The architect was tasked with providing instructions to team builders on how to build the robot using nonverbal communication. After completion of the task, each group was asked to reflect on the exercise and share what they learned with the entire class. These discussions were video recorded and thematically analyzed.

Results. The metaphorical models that students built served as a basis for discussion, problem-solving, and decision-making. Students described how this activity enabled them to mentally and visually link abstract concepts, such as decision-making and problem-solving, to actual practice. Three themes were identified from the qualitative study: thinking with hands, listening with eyes; linking theory to practice; and learning through reflection.

Conclusion. This activity offered a non-confrontational way to support communication and the learning process. The use of an interactive game can be a useful teaching strategy to create an active-learning environment, helping pharmacy students improve their social and cognitive skills, such as decision-making, problem-solving, and communication.

Keywords: communication, constructivist theory, problem-based learning, reflective practice, social skills

INTRODUCTION

Person-centered care, which is based on the premise that individuals have their own views and preferences about what their priorities in life should be, is integral to the delivery of safe and effective health care.¹ Studies have shown that this approach results in improvement in patient adherence, disease outcomes, and quality of life.²⁻⁴ A person-centered approach to care is built on three goals: eliciting the patient's perspective on the illness; understanding the patient's psychosocial context; and reaching shared treatment goals based on the patient's preferences, needs, and values.^{5,6} As such, social skills, or the ability to navigate interpersonal and social situations effectively using communication, leadership, and teamwork, are a

key competence for a successful health care encounter.⁷ These social skills, together with cognitive skills (eg, the ability to understand complex ideas; adapt effectively to an environment; learn from experience; and reason, such as critical thinking and problem-solving) are essential for health care providers to have to empower patients to make more informed choices.⁸

As a member of the health care team, pharmacists should develop these social and cognitive skills to ensure that they become successful practitioners and contribute to the optimization of health outcomes. Traditionally, the pharmacy curriculum has focused on students' acquisition of knowledge, skills, and attitudes. Students are expected to apply the knowledge and skills they have gained within and beyond the educational program. Recently, educators have advocated that the expectation be transformed from acquisition of knowledge, skills, and attitude to integration of knowing, acting, and being.^{5,9} Nevertheless, challenges remain in designing an effective course that provides

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students with the necessary skills and knowledge to facilitate person-centered care.

Collaborative game play has been widely employed to facilitate students' learning, foster teamwork and collaboration, and support the learning process within informal settings.¹⁰ Research has shown that it can encourage higher-level discussion, which enhances students' social and cognitive skills.¹¹ A large number of studies have investigated the use of various gaming activities to support pharmacy education, including simulation role-play, card games, board games, and crossword puzzles.^{12,13} These studies have shown that games can increase students' interactive participation and spur excitement, as noted in the positive feedback from students. Another key strength of using collaborative games in teaching is the ability to promote student-to-student interaction and peer learning, helping students be more engaged in discussions. Indeed, play can increase social bonding as it brings together a sense of partnership, cohesion, and cultural expression, which help develop leadership, teamwork, and cooperation.

The positive attitudes of students toward learning through games suggest the possibility of their use as a learning modality. This builds upon the constructivism theory that individual learners construct mental models to understand the world around them. Through building and constructing of a product or artefact, the student is able to construct theories and knowledge in their minds.^{14,15} The learners can then apply their knowledge through modelling and use of metaphors, thereby formalizing relationships that can otherwise be difficult to comprehend. Through play, learners are able to achieve a greater degree of authenticity to connect with their emotions and intuitions.

Building LEGO models as a game play technique for teaching and learning in higher education has gained much attention and research over the past few years.¹⁶⁻¹⁸ Using LEGO blocks these studies had attempted to create a safe space without any boundaries or social norms to allow learners to speak up and have their authentic voices heard. Studies have shown that this method was able to create a collaborative communicative learning environment for participants to share, develop, and express their ideas.¹⁹⁻²¹ The use of LEGO blocks also allowed learners to build metaphorical models that represented their experience and ideas.²² Participants' feedback confirmed that the experience provided them with a multitude of opportunities to work in groups and develop social and cognitive skills.

The Bachelor of Pharmacy program at Monash University aims to nurture and develop students who will be able to demonstrate the concept of a "seven-star pharmacist": caregiver, communicator, decision maker, community leader, manager, life-long learner, and teacher.²³ To achieve this, faculty have chosen to expose students to the roles of a

pharmacist early in the course curriculum using a variety of strategies. Since 2017, the school regularly invites practicing pharmacists to share their experiences with first-year pharmacy students in a one-hour interactive lecture followed by a two-hour workshop. During the workshop, students take part in a "world café" event, where they share and reflect on what they heard from the pharmacists during the lectures and how they relate to the seven-star pharmacist concept. Nevertheless, one challenge we identified was that students often lacked engagement and were unwilling to share ideas for discussion. In this study, we describe the design and assessment of an innovative education workshop using LEGO blocks to increase and foster pharmacy students' social and cognitive skills.

METHODS

In 2019, the authors developed a LEGO building workshop as an alternative learning activity to help stimulate discussion among year 1 undergraduate pharmacy students. The workshop was designed for students to engage in two activities: first, students built their ideal robotic model using LEGO blocks, and second, they participated as a class in a reflection activity immediately following the group project. The goal of the workshop was to enhance students' understanding of effective communication, collaboration, and decision making. This was enabled via the social and emotional activities of closely working in teams, which required active listening, dialogue, and receptiveness to the perspectives of others.

At the beginning of the workshop, Moodle was used to randomly assign students into groups of four. Each group was given a pre-mixed bag of 30-50 pieces of LEGO blocks of various shapes, sizes, and colors. Students drew cards to determine whether they took on the role of the architect or a team-builder. Throughout the activity, students were not allowed to speak with one another. Also, the architect was not allowed to touch the blocks, but could provide instructions using nonverbal communication. The builders in the team were required to assemble a pre-specified model based upon the nonverbal instructions from the architect.

While the play aspect was an important component of the workshop, this needed to be balanced with an appropriate level of challenge to ensure that student interest and engagement was maintained.^{24,25} To achieve this, the architect in each group was given a limitation at the beginning of the activity and asked not to share this limitation with the rest of the group. Every five minutes, an additional set of instructions or a limitation was given to each group or to an individual student within the group until the task was completed. No additional instructions were given

to students. Some examples of the limitations include creating the model using only a single block color, building a model that was at least eight blocks high, or building a foundation layer consisting of exactly 20 bricks. These limitations forced students to work collaboratively within and between groups, as the limitations required them to communicate nonverbally or even exchange bricks with other groups.

After the activity, each group was asked to create a poster that reflected and focused on an element of their activity that “struck a chord” with them and how it was related to the concept of a seven-star pharmacist. Each group was required to present their reflection about the activity to the entire class, which included up to eight groups. The presentations were video recorded for subsequent analysis by the authors. Faculty members who acted as workshop facilitators were available during the presentations to provide constructive feedback and reinforce the importance of reflective practice to students. Students were also given the opportunity to ask questions and make suggestions or comments to the presenting groups, providing them with an opportunity for reflective sharing.

To evaluate the success of the workshop, we determined that an inductive qualitative study rooted in grounded theory was the most appropriate approach to use.^{26,27} The following research questions were identified: “How does the use of LEGO contribute towards development of social skills?” and “How does the student feel using the workshop to develop skills?” Following the workshop, all students were sent a post-workshop survey of six open-ended questions to capture the students’ perspectives regarding the design and implementation of the workshop, any emotions experienced, comfort levels with the workshop, and perceived value of the workshop. The survey was distributed online via Qualtrics (Qualtrics). To triangulate the self-reported data, video recordings of students’ reflections during the workshop were also viewed to explore potential connections between students’ reflections and their responses on the self-reported questionnaire.

Both textual data and video recordings were coded independently by the authors for thematic analysis. The authors met to discuss the coding results, and a consensus was reached when differences existed. Finally, these codes were grouped into themes and subthemes and reviewed before data analysis and reporting. The study was approved by the Monash Human Research Ethics Committee.

RESULTS

All year 1 pharmacy students enrolled in the course during the 2019 academic year completed the workshop and assessment (N=114). The mean age of students was

20 years, and the majority were female (n=90; 78.9%). The post-workshop survey indicated that students (84%) thought the workshop improved their communication skills. Students were highly engaged during the session. Most groups made a LEGO model that was similar to an illustration of a human. However, several groups created very different models to explain the concept in an unusual and memorable way. For example, one group built a crocodile for their project, and described the importance of nonverbal communication and eye contact for communication. They related how play was important for learning, not only as a child, but throughout life. Other aspects described included the importance of being a decision maker and assuming a leadership position to ensure that the task got completed on time. Another group built a snake and related how that reminded them of a caduceus. They described what the symbol meant to them as future health care professionals, and the importance of empathy and caregiving.

From our analysis of the qualitative data gathered from this exploratory study, we identified three emerging themes. The themes identified were summarized as follows: thinking with hands, listening with eyes; linking theory to practice; and learning through reflection. Results are presented below, aligned to the research questions, with supporting exemplar quotes presented in Table 1.

The LEGO activity acted as a non-confrontational way to encourage and support communication between students. A majority realized how the activity helped them to improve their communication skills and the importance of communication as pharmacists in training. Participants mentioned the importance of using nonverbal communication, listening, and presentation skills to accomplish the given task. From the video recordings, we observed an interplay of social and cognitive skills during the activity, including decision making, teamwork, leadership, and time management. Students highlighted the conflict resolution aspects of the workshop, and saw the value of the activity in emphasizing the range of views they had obtained: “Even though we could not communicate, we managed to complete the task given. I learnt that having skills such as being a decision maker and communicator are important because without communicating effectively and making a decision efficiently, the task would not have been completed.”

The next theme identified was related to the knowledge gained by students. Students reported that the activity aided them in drawing out insights from practice situations. In particular, several students specifically emphasized the value of the activity to be able to link between theory and practice. This, coupled with the poster creation activity, provided students with a concept map, as these

Table 1. Exemplar Quotes From Reflections by Undergraduate Pharmacy Students Who Participated in a Group Exercise Using LEGO Blocks

Research Question	Theme	Student Quotes
How does the use of LEGO contribute towards development of social skills?	Thinking with hands, listening with eyes	I learnt to be a leader and to speak up on issues that matter to the group.
		I learnt to make decisions in a quicker amount of time. Due to the fact that we were given limited amount of time, I had to quickly decide on the bricks used. Furthermore, I learnt the importance of communication skills even though we only communicated through sign languages and gestures.
		The importance of working in a team. Communication is important for the exchange of information.
		I learned to communicate with my teammates through non-verbal communications as well as developed confidence in making decisions.
		I also learnt to think outside of the box such as improvising my communication skills with my team members to accomplish the given task.
		... we practiced communicating non-verbally, using things like gestures and eye contact during the activity.
		I've also learnt that not everyone can be the leader. Sometimes we need to give way to others so that there will not be conflict in the team.
		How to listen to others' opinions and ideas. I have developed the skills of having a good communication with team members.
		We learned about the qualities that a 7-Star pharmacist should exhibit. Furthermore, we learned that not every quality of a 7-Star pharmacist can be moulded in the short period of the pharmacy course instead it is a lifelong journey.
		It allowed me to see how the 7-star pharmacist skills, can be shown in basic tasks and activities.
How does student feel using the workshop to develop skills?	Learning through reflection	I've learnt more details about the 7-star pharmacist in a practical way. By learning through this method, it's much easier than reading long passages online about it.
		It's not always pharmacist who should have the seven qualities but everyone.
		It teaches [me] on how we [should] view on diff[erent] aspect of life
		During the debriefing, I can learn from others' experiences because different group went through different processes when conducting the activity.
		This enables me to participate and engage more as I am a very introvert person.
		It's important to adapt to a lifelong learner attitude even before being registered as a pharmacist so as to be open to develop the skills and experience that is beneficial to you not only in a pharmacy setting but also your life in general.
		It made me realize I still have a very long way to go in order to develop the seven points of being a 7-star pharmacist.
		I learnt skills that will not be able to obtain from textbooks.
		How to listen to others' opinions and ideas. I have developed the skills of having a good communication with team members.
		It helps me to discover more about myself.

concepts were broken down into small, understandable segments which student felt they could subsequently build upon. Students found the activity to be very fun and engaging and said it served as a conduit through which to engage with each other. For example, one student shared, "The workshop activity taught me that learning can be creative and fun but impactful at the same time." Some of the students also felt that greater engagement in the activity resulted in deeper thinking and long-term retention of learned concepts. The skills learned were not things the students felt they could have learned from textbooks.

The final theme summarizes the insights gained by students. Students reported that the activity provided an opportunity for them to self-reflect about their own thinking and progress. For example, students mentioned that they felt they would have been able to manage the task better if they had been more organized and delegated tasks to team members at the beginning of the activity. They wished that they had been more decisive, had been proactive in offering opinions, and had volunteered to make the presentation to the class. Several students also acknowledged the usefulness of the activity in teaching them about team building. For example, one student stated, "I learned that 'teamwork makes the dream work' and that communication is the key to the outcome of every project."

DISCUSSION

Our study found that using LEGO blocks as a form of play can be useful in educating and preparing health care students with the practical skills needed to enhance social and cognitive skills. The activity also created an opportunity for peer-learning, as it allowed students to engage within and between group members, as well as conceptualize their journey and development as future pharmacists. More importantly, students used the LEGO activity as an opportunity to improve their communication skills as they attempted to convey their views and vision without words. It also taught them the importance of listening. Based on the qualitative responses of students, we noted several examples of growth from the depth and quality of their reflections. In addition, we observed that the models created by some of the student groups allowed those students to express themselves more creatively and better visualize their learning than students in other groups, thus enhancing those students' learning experience.

While the introduction of this activity to teach social and cognitive skills was experimental, our evidence suggests that it was successful. Overall, the activity made students feel more relaxed and enabled them to communicate in a more stimulating and enjoyable manner. The building of the LEGO model allowed students to build something

that represented their knowledge and understanding of what it meant to be a pharmacist. In the discussion that ensued during the poster creation session, we observed elements of peer-led team learning, where students began to engage with each other to enhance their learning.²⁸

Active learning is part of the teaching ethos at our school. As such, teaching activities were designed to ensure that any problem-solving and decision-making exercise required active participation among the groups. The LEGO workshop embraced this principle, where through active play, students were able to demonstrate their understanding of how these skills were important for their future development as pharmacists. The activity allowed students to explore and construct objects to demonstrate a deeper understanding of concepts of decision making and problem solving.²⁹ While the use of LEGO blocks has been examined in other disciplines, such as engineering and business courses, only limited studies have attempted to use LEGO in the teaching of health care students at institutions of higher learning.^{17,30-32} In a separate study by Kirby and Pawlikowska, the authors examined the use of LEGO to teach the basics of pharmacology. In their study, the authors used elements of play, teamwork, and peer-teaching to revise the core concepts in pharmacology. Students reported that the activity was an enjoyable way to learn difficult concepts that might have otherwise seemed boring.³³ The researchers also reported an improvement in students' knowledge after the intervention, as shown in the higher scores on multiple-choice questions completed following the team interaction. Harding and D'Eon used LEGO in their workshop to introduce first-year medical students to patient-centered interviewing. They noted that the activity supported the development of effective communication and students expressed more confidence in questioning techniques.³⁴ Similar to this study, the authors found that students were able to be more aware of what they had learned from the activity.

Studies have reported that learning is often incomplete without a debriefing as it allows students to understand the purpose of the activity. Debriefing allows for students to be fully engaged in the process, elaborate and describe their roles, and socialize with new members for their future working environment. Because of this, we included a debriefing session after our activity as this afforded students an opportunity for reflection, which is a valuable component in the experiential learning process. During the debriefing, students were able to reflect further on their experiences and integrate their prior learnings with the new knowledge gained during the activity, as well as think about how this new knowledge could be applied in their future roles as pharmacists.

Students spoke enthusiastically of the workshop and indicated that the LEGO activity was the highlight of the

session. Students also described the importance of using a multimodal communication strategy to give instructions. Students seemed to have little trouble in identifying with the activity and how this analogy was related to the social and cognitive skills they would need to develop to succeed as pharmacists.

In this study, we attempted to triangulate our data using students' self-reflections and debriefing sessions, which allowed us to explore similarities and shared themes as well as preserve the granularity of students' experiences. We purposefully video-recorded the sessions so that we could review them, and we gave equal weight to each participant's account in our analysis and write-up, which further boosted the credibility of these findings. While this is useful, the small sample size of our cohort may limit the transferability of our findings. Our workshop was a very simple yet cost-effective teaching method that can be implemented by most educators from various disciplines. While technology-enhanced learning is now becoming more widely adopted, it does incur significant setup cost that can be prohibitive.³⁵

This research has some limitations. As this was an exploratory study, the activity was only conducted once over a short time span. As such, the activity may not suit all students as most learn at different paces, with some requiring more time to fully develop skills. Our cohort was limited by its diversity, given that most of the students were female and middle-class. Finally, we did not assess changes in students' knowledge or skill domains before and after the workshop. We only assessed the students' perception of the activity as it was not feasible for us to track the changes over a longer time span. Nevertheless, we believe that the use of LEGO blocks is a good interactive activity that can help pharmacy students think about the qualities they need to develop as future pharmacists.

CONCLUSION

We describe an innovative activity for teaching social and cognitive skills to pharmacy students. The activity provided an environment where students could interact freely and articulate their views and opinions in a fun and engaging way. Through the building of LEGO models and participation in group work, students reported having an improved understanding of how skills such as decision making, problem solving, and communication are important to develop as they prepare for their roles as pharmacists.

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