The "Power" of Playful Experience

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All around the world, people are inclined to play from a very young age. It is a behavior that seems so universal yet is seen differently across society (Gaskins, Haight, & Lancy, 2007). Some societies encourage children to play; others, in the contrary, discourage it, and some might just accept the presence of play as it is. No matter the cultural attitudes towards play, it is evidently fun to children (and adults as well). It would be useful to any society to put their judgments of play aside and inspect its potential contribution to their younger generations and to itself. If play provides any substantial benefits to child development or learning, everyone should encourage children to play. On the other hand, if it does not contribute in any tangible way to a child's upbringing, parents should directly guide their children to use their play time to more important occupations. Children want to play and if there is a good way in which play can be helpful to them, there is no reason to not let them do.

This paper is meant to be a review of scientific evidence pertaining the effects of play on children's cognitive development and learning. To get a broad view of play's effects, three aspects of play are explored: learning and development through outdoor play, approaching mathematics through play, and improving learning through pretend play. Examining findings

from these three areas of play will provide a well-supported conclusion on how play affects cognitive development and learning so far.

Some playful education initiatives have been undertaken in the recent years (Coates & Helena Pimlott-Wilson, 2019). An example of this type of initiative is Forest School, an alternative learning programme based in the UK. It promotes the idea that children can learn better in informal environments, outside the classrooms. Children undertaking this programme are exposed to various play-based learning activities that are not always possible inside classrooms. Students learn to use tools, cooperate with other students, and build something as a group. The support from this initiative has grown substantially in recent years. Despite this fact, there has been very little studied evidence to validate this programme.

With the intentions of getting more concrete data, Coates & Pimlott-Wilson (2019) investigated two primary schools that offered Forest School program to their students. They conducted a qualitative study about the programme by interviewing children taking part in the programme (as well as the adults working on it) concerning what they have experienced through outdoor engagement and Forest School. A total of 33 students around the ages of 4-5 and 8-9 were interviewed. All interviews were audiotaped and transcribed for analysis. The researchers then proceeded to do a phenomenological thematic analysis of the children's reports. In other words, they analyzed each interview to be able to identify overarching themes that are seen

across the children's experiences. The identified themes were evaluated in terms of their implications and validity.

As a result of their thematic analysis, Coates & Pimlott-Wilson (2019) found three interrelated themes: a break from routing, learning through play and collaboration and teamwork. The children commonly reported that learning outdoors was very different from normal school. They felt less pressure and more autonomy. Being was seldom associated with learning for them. This new experience made them more engaged and active in what they were learning. There was significant good feedback concerning the practical skills, such as the crafting, using tools, and creating objects. The participants also appreciated their opportunities to partake in activities with other kids and understand one another's roles to complete a certain task. This was reported to be both socially and educationally enriching.

After analyzing such overwhelmingly positive feedback about Forest School, Coates & Pimlott-Wilson (2019) concluded that Forest School programme can benefit through useful skills and social opportunities for children, such as problem-solving, creative thinking and social networking. They also note that traditional educators should be encouraged to implement more outdoor-oriented learning and playing. Benefits highlighted by their study can also be harvested by other primary school students and not only through Forest School programme. Despite this positive conclusion, it is important to note that most of the information was insights from the

children themselves, and there is still not enough quantitative and precise data to pinpoint the effectiveness of these kinds of learning approach.

When children must eventually attend classrooms however, one specific subject that primarily contributes to their early struggles in school is Mathematics. The international median of 4th-grade students reaching the High-level international benchmark is only 36% (Mullis, Martin, Foy, and Hooper, 2016). Math is undeniably hard for some students from their early education until their high school graduation. It may even be one of the subjects that prevents students from appreciating their school experience. Along these lines, some scientists have tried to link the learning of mathematics with play, an activity that does not require many incentives for children to take part in. Perhaps children can acquire better appreciating and/or understanding in Mathematics through play.

One study conducted by Ramani and Scalise (2018) examined possible ways families from low-income backgrounds could make use of play-based mathematics to improve their children's early mathematical development. Ramani and Scalise (2018) argued that there is a clear gap in mathematical development between children coming from different families with differing financial incomes. They hypothesized that providing these low-income families with mathematical card games to play in informal settings, such as at home, could potentially aid in reducing income-based gaps in children's knowledge in mathematics.

Ramani and Scalise (2018) enrolled thirty-nine Head Start preschoolers along with one parent/guardian per child. The sample had an evenly shared number of boys and girls ranging from the ages of three years and seven months to five years and seven months. Most of the guardians/parents were females (85% of them). Each pair of child and guardian/parent was randomly assigned one of two types of games: a numerical magnitude comparison or a shape and color matching game. Each guardian/parent was taught how to play the game and given a kit of all necessary materials, such as an audio recorder and a deck of cards, for them to be able to complete their assigned task. Each guardian/parent and child were asked to play their respective game for 15 minutes twice a week at home for six weeks. They wrote down the times and took an audio record of their play sessions. Before and after the six-week intervention, each child had to take a test assessing topics such as cardinality, shape names, and counting. The scores from the tests were taken as measures to see any effects of the play-based interventions.

The data collected from the samples showed that there was a significant increase in the test scores of the children who took part in the shape and color matching card game. However, there was no significant difference between the scores of the pretest and posttest for the group of children who were part of the numerical magnitude comparison intervention. Even though the results are not consistent over the interventions, they also suggest that play-based interventions can at least improve children's foundation in geometry. Ramani and Scalise (2018) suggest that more replication of the study in which parents/guardians would get more training prior to the

task and more time to play with the children is needed in order to find more robust evidence to support the findings of the study. Despite that, they concluded that the overall result of the study contributes to the body of evidence that early involvement in play-based mathematics can improve children's background in mathematics.

Another perspective on the relation of mathematics with learning was explored by Trawick-Smith, Swaminathan, Baton, Danieluk, Marsh and Szawacki (2017). They investigated the relationship between block play and math learning in an American child development center, where children could have at least two hours of free-play time per day. The sample consisted of 41 preschool children around the age of three to four. The children's block playing sessions were video recorded in 20-minute observation episodes over a period of 6 months. The toys made available for the children alternated weekly between all-blocks toys and blocks with replica toys. The experimenter used a child testing method, called TEAM (Tools for Early Assessment in Mathematics), administered to the children before and after the six months of observation period. They recorded the results from the tests as well as the frequency of block building, the duration of the building, the complexity of the building, and child-to-child and teacher-child interactions during each 20 minutes of observation period.

As a result of the data collected from the experiment, the difference between the TEAM pretest and posttest scores heavily supported the idea that block play improved math learning.

Among the block play factors, block complexity scores were a strong predictor of the posttest scores. The amount of social interactions during the block play also correlated positively with a higher posttest score. These results are in tandem with results found by Ramani and Scalise (2018). Involving play into learning seems to have an overall good effect on children's understanding/knowledge in mathematics.

These encouraging results show how play can affect a specific subject being dealt with in classrooms. It is important to analyze findings related to play through the opposite perspective as well: how does one type of play affect learning in general. Among all the types of play, pretend play is the one reviewed in this paper as it is one of the most prominent forms of play. The research to find the relationship between pretend play and learning/development can be traced to the 1970s and 1980s (Bergen, 2002). However, an extensive metanalysis done by Lillard et al. (2012) concluded that there is very little, clear evidence on pretend play's effects on children's development. An investigation conducted by Hopkins, Dore and Lillard (2015) was designed to remediate the lack of conclusive evidence. Hopkins et al. (2015) investigated the possibility for children to acquire information through their pretend play through two controlled studies.

In the first study, the researchers enrolled 56 children around the age of 5 years old. These children were assigned to either a pretend or real condition. Both trial groups underwent sessions of demonstrations in which they were exposed to a novel object with a given label. The

only differing part of the demonstration between the two groups was that the pretend condition were asked to pretend that the given object had a novel, alternative function while the real condition were given the real context in which the object could be used alternatively. After the demonstration session, the participants were tested on their acquired knowledge through identifications trials, sorting trials, function trials and memory trials using the objects varying similarities and functions from the ones they were exposed to during the demonstration. The experimenters recorded the children's responses for each trial and then interpreted the data.

After interpreting the data, Hopkins et al. (2015) inferred that the children could learn the demonstrated objects' labels and functions through pretense. Due to irregularities from the data collected in Study 1, the researchers speculated that the functions taught to the children could have biased their answers. They decided to conduct a second experiment that eliminated function as a factor being taught and tested. The sample of the second experiment consisted of 54 children around the age of five years old. It is not specified whether these children were the same as the ones who consisted the sample of Study 1.

In Study 2, the children underwent the same demonstration and testing phases with the function being replaced with ownership in the demonstration phase and the function trial being omitted from the testing phase. Most of the results from the Study 2 were replicating the findings of Study 1. The general pattern from the two studies leads to the support of their prior suggestion

that children may acquire new information through their pretend play. Despite the little supporting evidence from older studies (Lillard et al., 2012), more recent studies such as this one seems to hold that the use of pretend play in learning is an idea that is far from being irrelevant and inconceivable.

In sum, examining play's influence on learning and development through outdoor play, its effect on mathematics, and its pretense aspect provided broad but useful insight to the evidence supporting play's overall positive contribution to children's learning and development. Coates and Pimlott-Wilson (2019)'s study of outdoor play through the Forest School intervention highlighted the speculative benefits of play towards primary school students. The combined results from the studies of Ramani and Scalise (2018) and Trawick-Smith et al. (2017) provide more supporting data inferring the effectiveness of play in initiating children to mathematics. In accordance with those findings, Hopkins et al. (2015) found a positive relationship between pretense and learning new information. Taken altogether, even though research findings have been mixed throughout the years, the positive pattern relating play and learning from three distinct perspectives lead to the hypothetical but well-educated conclusion that play should not lose ground in children's education and development.

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