

GAMING: AN EFFECTIVE APPROACH FOR BUILT ENVIRONMENT EDUCATION

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Abstract

Numerous studies have stressed the importance of gaming for all age groups, including better memory and problem-solving to improved mood and social skills. Games are also to unwind and relax. Games also lead to bouts of laughter that stimulate endorphins. This simple act of having fun can help boost serotonin, relieve anxiety, and increase enthusiasm in other areas and walks of life. Games include board games (tabletop games), body-space games, video games, mind games, and others. Can games be an educational tool? This paper argues that gaming is a powerful tool for teaching children about life in general, and about the built environment in particular. Hence, the structure of the paper revolves around a few main ensuing questions: What are the skills and knowledge foundation that BEE brings and develops? How does gaming affect children, what does it convey, and what does it tackle? Is it possible, then, to create and design BEE games? Who is legible to design them? In what context? Are there any reliable examples? Can we generalize BEE games (and any other BEE “edutainment” tools and kits) for other age groups and societal sects? The methodology, therefor, is based on a quick review of literature pertaining to the ultimate skills and knowledge offered by built environment education to children and youth. Then, the paper moves to highlighting games and gaming as an effective educational tool. Following, is a review of some examples of BEE games from Egypt, designed and demonstrated for the local (Egyptian) Golden Cubes Awards over a ten years’ time, in addition to a few examples designed and examined by students of architecture as assignments in specific history and theories undergraduate courses in an Egyptian University. While discussing the impact of applying the games requires further research, nevertheless, showcasing the designed and applied games examples revealed an opportunity for a new approach of built environment education, that can be practiced in schools, at home or in true settings. It also paves the way ahead of a better collaboration between school education and architectural academia, BEE providers and students of architecture, and the community at large.

Keywords: Built Environment Education, gaming, games, educational approaches, architecture and children.

1. Introduction

Children’s cognitive functioning and development vary across different domains and cultural contexts as well as across different conditions and situations. Yet, still there are some common features that dominate their cognitive growth, particularly in the middle childhood phase (between six and twelve years old). Such of those features are proved to be developed through children’s interaction with their surroundings. More research on the topic reveals that learning about architecture and the built environment helps children and young ones develop their critical thinking, improve imagination thus leading to creativity; their perception about their physical surroundings, where they go and spend their lives and where they interact and socialize, does influence their experiences and contribute to their education in ways that go unnoticed.

According to the Italian educator and psychologist Loris Malaguzzi, the built environment itself is an active educational agent. This implies the urge to shift from the conventional teacher-orientated model to one in which the environment itself contributes significantly to pedagogical outcomes. Learning can then happen either in settings other than the classroom, or through simulation. And here comes the role of gaming. Games aren’t just fun – they’re also educational tools. This paper argues that gaming is a powerful tool for teaching children about life in general, and about the built environment in particular.

This paper reviews the skills and knowledge gained and/or developed by the built environment education for children and youth particularly in the middle childhood phase. The paper then moves to

outline the multiple benefits of gaming as an educational tool and the games effects on the cognitive development, social skills and other transferable skills. Afterwards, the paper showcases some built environment education games designed in Egypt for discussion and appraisal.

2. Skills and knowledges related to Built Environment Education (BEE) for children and youth

According to Mathews, children's environment is usually defined as a social, cultural and physical context. Different disciplinarily studies provide and understanding of how children interact with and relate to different types of environment (Matthews, 1992). The related literature takes a multi-disciplinary approach that employs perspectives from several fields'; geography, anthropology, developmental psychology and environmental psychology (Bronfenbrenner 1979, G. Moore, 1985 & 1988). According to the world bank, this approach also touches, tackles, collides with and overlaps with learning for the top 10 skills of 2025, including analytical and critical thinking, active learning, complex problem solving, creativity, leadership, technology use and design, resilience, reasoning and 'ideation'. Suitable formats vary from the simplest small sized indoor board games to sophisticated design-build participatory urban interventions and installations. There are also several overlapping fields of inquiry that inter, trans and multidisciplinary. "Curricula" and syllabi design are also considered in terms of both educational taxonomies, and young people's multiple intelligences and learning styles.

BEE helps children in acquiring many skills, including analysing precedents, critiquing spaces, buildings and landscapes, exploring the narratives behind them, comparing their inherent theoretical frameworks to their resultant physical appearances. This allows the children to go beyond abstract concepts, question assumptions, evaluate solutions and think systematically, and support essential skills for tackling complex challenges and hence cultivating critical thinking. One more added value of Built Environment Education is the development of multiple senses (sight, touch, hearing, smell and taste).

According to educational psychology, middle childhood is an age characterized by the sense of exploration, the children's world expands outwards and the attachment to the family and household lessens (Hoff 2003). Children at this age move to the wider social and urban context which strongly influence their motor, emotional and cognitive development. They seek more freedom, and they start to become aware of their rights. What children learn at this age develops their self-confidence and independence. The provision of the right education at this stage helps them master and control their world and become successful and proactive citizens (Chawla, 1992; Kasinath, 2013; ECCles, 1999). Piaget identifies four stages of cognitive development. The sensorimotor stage, the pre-operational stage, the concrete operational stage and the formal operational stage. According to him, middle childhood is termed as the concrete operational period stage. During this period, the children become more logical and organized. Children's cognition of space becomes richer and more specific Piaget and Inhelder cited in Matthews 1992. Moreover, they put the place in its larger geographical context. The give clear directions and start to perform mental rotations and can get from one place to the other.

According to environmental behavioral studies, this period is when children begin to build personal image of the environment, environmental perception, and new experiences. As they understand spatial representations, such as aerial photographs, maps and drawings, and have the ability to relate them to real places (Tuan, 1977, Matthews, 1992, Plester, Blades and Spencer, 2006). Children at this age also understand other human aspects including privacy and personalization. Children no longer confuse their views with those of others. This period marks a significant turning point in growing independence and creating self-identity. Through their interactions with the physical world, appreciation of space grows as their sense of self-identity (Matthews, 1992). Middle childhood children are the heaviest users of the outdoor environments and their physical environment becomes a main concern in their experiences. Cobb describes the middle childhood years by a special age when children have the greatest chance to "explore an ever-expanding repertoire of reachable places, in search of new experiences" (Chawla, 1992).

3. Games as education tools

Research affirms that learning best happens through play, and develops multiple skills, while develops skills relating to improving the academic performance, enhancing career skills and lifelong learning. The secret ingredient stressed as the common factor in all games and gaming activities is ensuring "experience" in true settings, or a simulation of them. Literature on the effect and impact of gaming and games vary and expand to include cognitive development, social skills, and other transferable skills. Cognitive development includes better critical thinking, improved memory and concentration, boosting problem solving skills, and creativity and Imagination. Social skills include strengthening relationships, teaching Skills of? And bridging any difference gap between cultures, gender or age groups.

Gaming and games for built environment education create strategic challenges, cooperative adventures, or narrative-driven experiences entertain and engage. They include guided walkthroughs with engaging social activities, treasure hunts, food tasting, sketching, photography, solving riddles, meeting local key persons and listening to their narratives, storytelling, argumentative debates, acting, role playing, physical gaming, singing, choreography, colouring, reading books, solving riddles, small and limited participatory design and urban interventions in different areas and communities.

While games include portable kits of interactive ‘edutainment’, including workbooks/blogs, story scenes, riddles, puzzles and word game notes, as well as board games, building and making games, card games, interactive books, and many more, design should either be community/society, geography, history, heritage, and culture oriented, and tailored accordingly. Varying from the simplest small sized indoor puzzles and board games to sophisticated design-build participatory urban interventions and installations through design build games achieved through role playing, there are also several overlapping fields of inquiry: inter, trans and multidisciplinary. Printed/physical games design requires the collaboration of both graphic and product designers in collaboration with educators, sociologists and psychologists.

4. BEE games

The forth examples showcased are outcomes of two intertwining missions undertaken thru the past decade (2016-2026). A few examples are a product of an architectural undergraduate task in one of the Egyptian universities¹. Through basic design courses, history, theory and criticism courses, and urban design courses, the students are asked to design and demonstrate a BEE game for middle childhood, with an outdoor application in true settings as an examination of the students’ understanding of the one of the topics of the course content. The assessment of the games is according to the clarity of its educational objectives and the applicability of the game design, its demonstration and the children’s and the players’ feedback. Some of the games are practiced with children on campus, some at home and some in their true settings. Other games (not exemplified here) include scavenger and/or treasure hunts in historic districts or inside buildings, and some are role playing for characters tackling events in their original places. Some include observation and investigation of people and places. Some include group evaluation of certain aspects in a certain setting or community, and many more.

A few more examples showcased here are BEE games designed for the national phase of the Golden Cubes Awards². Their evaluation takes place through a jury of five renowned Egyptian figures, including architects, professors of architecture, teachers, pedagogues, product and graphic designers and a media specialist. The jury examine the already accomplished and practiced works based on some criteria, including: are the educational objective clearly stated? does the game endorse the children’s understanding of the social, economic and environmentally sustainable concepts? Does it incite sensitivity, creativity and critical thinking? is it interesting and fun for eh children and youth? is it backed by educational or social institutions or enterprises, or was produced in partnerships? Can it be repeated, can it be applied everywhere? is it flexible to be developed? etc.

5. Discussion and conclusion

Due to its limitations, the paper at hand briefly reviewed the literature that highlights some of the skills and knowledge developed by the built environment education for children and youth. Then it summarized the multiple benefits of games and gaming on the cognitive development, social and transferable skills improvement. And finally, it featured some BEE games designed in Egypt for discussion and critique.

The closer examination of the random featured examples affirms that BEE games did present visions that support values of sustainable development and highlighted the UN17 sustainable development goals. It also affirms that they-the games- raised children’s awareness of the built environment culture and introduced them to architectural and heritage values. They also encouraged and trained interactive participation of children and youth to be partners in shaping the urban landscapes of their communities. And finally – whether interactive books, physical or product games, or whatever gaming application, they were effective as innovative educational tools to convey architectural concepts.

Working on the topic for over fifteen successive years, it is obvious that the array of objectives, scopes, typologies, and designs of the different developed BEE games demand a further article and a deeper

¹ MIU (Misr International University): A private Egyptian University affiliated with a number of International institutions and organizations.

² The Golden Cubes Awards: are triennial awards organized by the Architecture and Children work programme, International Union of Architects, to appreciate the schools, organizations, initiatives, groups and individuals who work on the built environment education worldwide.

scientific analysis. However, a quick perusal of the already produced games, their feedback, and their professional appraisal affirm their true contribution to the co-production of BEE knowledge. Indeed, they seem like a golden mine for BEE practices in and outside of the classrooms. More empirical research is still needed where architects together with educators and policymakers are encouraged to recognize and exploit the power of architecture as an educational tool.

However, and having reached this point, it can be affirmed that architecture and the built environment *ARE* the “third teacher”, in class or out of school borders. This is what Kolb and Piaget termed as learning by doing; first-hand and learning from real-world examples. Indeed, the value of architecture is significant and has the potential to transform education. Rethinking education through the lens of architecture, considering the city as an open text book offers endless prospects to enhance learning, foster creativity and promote children’s well-being, ultimately shaping novel, more efficient and multimodal educational models.

6. Figures



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