

Prospects of Customization in educational pedagogy through Motion Sensing interactive educational games in India.

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Abstract:

With the world turning more sensitive towards health and activity, People are trying to find a connect between technology and routine to converge the effects of motionless behaviour. Many gaming systems like “Microsoft’s Kinect”, “PlayStation Move” and “also smart-TVs with other smart devices are adopting the technique of control through body movements. The games attract the attention of the children and thus engage them into the fun activities while leaving them imbued with knowledge. The apps like “Nayi Disha”, which is for preschool children, educates the toddlers while they play the games on the app. It deals in communicating with the kids while utilizing their kinetics to interact, play and thus learn. The uprising culture of fortuitous games has resulted in the popularisation of virtual gaming among both genders irrespective of their age. Through my study I shall work on the different kind of conjoint campaigns which can be created by utilizing motion sensor technology and gaming, which will be more engaging, educational as well as enjoyable for the target audience. There has not been much research done on using this type of technology for collaborative campaigns, and this will create some riveting exploration, my study will dig deep into the challenges and techniques applied by the gaming organizations to overcome the requirements of target buyers/players in the field of education in India. With the pandemic continuing for almost one and a half year, such game application numbers have flourished which uses the cameras and sensor of the device to detect the motion by the children, now these will be customized with the latest technology.

As the mind full activities should be a dominant part in a child’s development process, this when integrated with technology turns out to be an amazing method with material for brain development and educational growth (Cassar, A. & Jang, E. (2010). Now a days Children prefer being sedentary which is harmful for their health, When the children are reacting and interacting through these games; they are physically involved causing their body movement in form of exercise or dance which is better for their health (Donnelly, JE & Lambourne, K. (2011). The Kids are excited to earn the points while they are dodging, ducking, Jumping and dancing. Such games are becoming newly popular by making an active classroom as well as the play room for the children. These applications do not require any external hardware and are capable of functioning through the device like tablet or Mobile phone. My study will be supported by analysis through case study methodology, which will lead to how these apps are serving to the environment and helping in education within the virtual world.

Keywords: virtual literacy, game application, motion sensor, active teaching.

Introduction:

The education system being highly organised and complete all-in terms of knowledgeable content, fulfils all possible requirements of visual and auditory learning styles, whereas about 45 % of the students are kinesthetics learners, who understand various concept by practically attempting them with an action. The system of educating a child has been focussing in one methodology and rarely steps in other forms, this way we disregard the requirement of such students and consider them as restless or naughty ones who are not focussed on teaching. To solve this issue video game-based learning has been introduced in various classrooms. A playful method and approach are a stress-free enjoyable way of learning anything new, the psychological and physical form of play altogether boosts the spirit of player, these games could be chosen over static play form which requires least or zero mobility, or maybe a combination of both. The attractive trends of technologically advanced video games take up a lot of preference when given a choice between indoor or outdoor play(Dede, C. (2011). The video games are looked as a medium of stress buster, learning, training, socializing and entertainment. The

contemporary video games are enriched with advanced interactive elements like facilitated graphical user interface, motion cameras, which respond to the players actions, reversion process and a lot more, the games are focussed on inducing relaxation mode with motivation enthusiasm through the latest elements.

My study deals in the comparative study of motion sensing games and regular games as how it effects the education and development of the children who are playing them, with special reference to the motion sensing games developed by Indian platforms Nayi Disha and Kaju.

The platforms are incorporating suitable Information Communication Technology (ICT) tools like , through the mobile application, clicker devices and flipped classroom, which through motion sensing feature promotes the digital culture of education in the learners by a lot of means such as Cost effective technology, Restructuring of class room teaching, Converting the paper based manual procedures into automated solutions, Simplified student management, LMS tools linking the students and teacher together, Better teaching with graphics and creative designs(Hauge, J. B., Berta, R, 2014). The aim of such interface is to read the action and movements which the player is doing and convert it into the game. Sony eye toy has come up with successful coordination in players action and similar reflect in the game, although sometimes the technology fails to read the moments causing a break in play, the technologies like motion sensing and touchscreen are now available to the players at economic rates, unlike in the previous times when the price was very high. According to a theory based on study by Karadimitriou, K. and Roussou, M. (2011) and Frutos-Pascual, M., Zapirain, B.G., Zorrilla, A.M. (2014), detail that From the traditional and conventional learning we have upgraded communication which has invented from the sensor innovation, the assorted data of actions is read and processed by the technology with the elements like lights, entryways, PCs and mobile phones, thus bridging the gap between actions and their electronic reading on the screen. The learning framework planned and created like this helps in shaping the critical thinking abilities of the learners. According to the theory by Gardner, the intellectual capacity of a person holds, interpersonal, musical, spatial, and linguistic intelligence. The platform like Nayi Disha has developed multiple games which follow Howard Gardner theory, and believe that the children can have different adaptations while learning, for example, through music, through looking, moving etc. The nayi disha studio developed computer games for preschool children.

Research Questions

My study aims to examine the results obtained by incorporating motion sensing games in the syllabus of toddlers. The specific mathematical, English and science games developed by Kaju and Nayi Disha, a Bengaluru based company. Through the research I wish to study students' approach and attitude towards learning by motion sensing also, this study was guided along with the following questions:

1. What was the impact of the use of motion sensing game application in the classroom on mathematics fluency?
2. What was the impact of the use of Motion sensing video games in the classroom on literacy fluency?
3. What was the impact of the use of motion sensing game applications in the classroom on students' attitude toward school?

Objectives:

This study has been performed to learn the utilization of a different learning process build upon the kinaesthetically advanced curriculum, the various objectives of my study are:

- 1) To analyse the success of motion sensing-based learning through video games.
 - 2) To understand the parent approach and outlook towards the mode of learning specifically through video games.
 - 3) To identify the positive and negative aspects of educational pedagogy through motion sensing video games.
 - 4) To understand the future of motion sensing games and associated education.
- a) *To analyse the success of motion sensing-based learning through video games.:*

Khan, N., Raine, L., (2014) emphasize over encouraging the physical exercise along with scholarly education results into the well better health as compare to the static posture choices. Players cannot identify the hours spent on devices while they are playing games, this results in a larger span of time served in one position (Budde, H., Voelcker-Rehage, 2008). This study has analysed the benefits of nayi disha video games which are educating the toddlers and also looking after their kinetic movement. According to Brooks, 2012; Hess, 2014; Horn & Evans, 2013; Jensen, 2005; Rose, 2012, trial and error under an expert is a better mode of learning a new skill, it helps in cognitive development of the information processed by the brain , continuous excitement while playing such games increases the dopamine release which further interests a child and enhances its ability(RQ 2). Research by Castelli, D. M (2015) and Charlton B., Williams R. L., McLaughlin, T. F. (2005) has shown that encouraging fitness in students helps develop their learning abilities (Wittberg, Northrup, & Cottrell, 2009). Rauner, Walters, Avery, and Wanser (2013) and Gao, Z., Hannan (2013), concluded that a decreased BMI leads to improved health, and a fit person works well in academic, hence social and economic level gets the boost.

- b) *To understand the parent approach and outlook towards the mode of learning specifically through video games.*

Nayi Disha has identified the dilemma of parents and their sense of unpredictability in choice of right curriculum or strategies for their toddlers. In Nayi Disha testimonials by the parents we can clearly map the bridge between what parents want and how correctly Kajju fills it. Some toddlers have enjoyed maths by jumping and thus moving ahead in the game, with aliens explaining or running the game on toddlers directions and actions, the parents need not to be worried about how their children are liking the games(RQ 3).

GAME	Physical development	Cognitive development	Emotional development	Social development
Body and brain Connection	X	X		
Kinect sports	X			X
Kinectimals			X	X
The Fantastic Pets			X	X
Kinect Adventures	X		X	X
Disneyland Adventures	X		X	X
Sesame street: Once upon a monster			X	X
Kinect FunLabs		X		X

Categorization of Educational purposes through the Kinect games (Kandroudi & Bratitsis, 2012)

The study has received qualitative feedback from the parents, which is as follows:

- The toddlers were highly enthralled with the intervention programme, while narrating about the games, they had remarkable references and encouraging comments about the motion sensing and responses by the game design.
- The course and pedagogy followed by Kaju inspired the children and they were excited to attend the school because of the excitement created by Kaju.
- The toddlers also kept talking about Kaju and they were narrating their tasks, were also keen to follow Kaju at home, and other study centres where they were learning courses.

c) *To identify the positive and negative aspects of educational pedagogy through motion sensing video games:*

The study has been carried over with an intention to divide the approach towards motion sensing-based teaching, and how the students/toddlers are responding towards this, Most of the games which are designed by 'Nayi Disha' are based on the curriculum designed for primary and secondary education, the children of this age are excited to play and specially the games which can serve to their kinetics (Malinverni L & Pares N. (2015). These particular needs are catered by the games of 'Kaju', and the toddlers are happy to play them and watch themselves winning the games. But there are a few features which can be improved to gain better outputs, these features could be the assessment system, where the students can win badges or stars like those in classes, maybe more attractive background sounds to make the game more interesting, the levels can have a longer pause time to make the toddler understand and take next action etc.

D) *To understand the future of motion sensing games and associated education.*

The aim of this article is to contribute to the education pedagogy, by developing and understanding custom made tools and methods which can identify the solutions in different streams of education. These tools will be based on human movements and designed accordingly by the designers, it can also serve the purpose of educating children with special needs or adults for various tasks. Human movement can be identified as a base of designs in the motion sensing technology systems.

Literature Review:

(Hsu, Lin, & Shih, 2013) detail that while the players are immersed in the motion sensing games, they relieve their subconsciousness, and express their emotions completely without fearing of the inhibitions. The factors like inclusion of metaphorical representation, interpersonal interaction, higher rate of expressions result in the advantages players receive while playing with motion sensors. Lee, W., Huang, C., Wu, C., Huang, S., & Chen, G. (2012), Kontra, C., Goldin-Meadow, S. & Beilock, S. L. (2012) and Abrahamson, D. (2014) state that the embodied learning perspective, effects the brain functioning and therefore the cognitive process, his study has focussed on children's activity while using the motion-based technology. The players share and support each other, so they project higher rate of action, thus slowly adapting the educational guidance from the game design. In the context of education, there has been a move from traditional culture to cognitive practices. By following the same, that pedagogical strategies like design thinking (cross 2011), will help the educators to make an easy explanation for thinking aspects of the students (Cakmakci, 2012). In an experiment by Alves Fernandes (2012) while playing the video game, the devices like VR headset and Motion control devices were combined

to identify the challenges and possibilities to improve the human computer interaction in future. A paper by Angelkov D (2013) details an application in the chess game controlled through the tracking of game objects and motion detectors, by recording hand movements with the help of web cam, which is following the moves made by hands, for this they used a chess engine and thus concluded that the use of natural interface like motions and gestures can develop more interest in the game than the use of standard computer services. Johansen, (2020) in his study made on Systematic research which was conducted in Medline over the cerebral palsy patients with the help of a video game controlled by motion sensors for a systematic function of hands and arm. This study proved better than the traditional study. Physical education programs in schools have the potential to promote healthy, active lifestyles by providing children with some of their recommended physical activity, increasing their physical fitness levels, and teaching them generalizable movement (Stisen, A., Blunck, 2015) and behavioural skills. A study by McKenzie, T. L., & Lounsbury, M. A. (2009) states that if “exercise is medicine,” physical education is the pill not taken. Multiple obstacles like restricted time limit, non-updated curriculum, lagging subject status results in barring the standards of physical education in the schools and training institutes. According to Bhattacharya et. Al. 2015, the utilization of motion sensors on mobile devices of users has generated a lot of opportunities in the research area of human activity recognition.

Methodology-

According to the research, the academicians struggle with the available resources, which are not sufficient for the training of the students, we have designed a systematic survey which comprised of questions for educators and parents in schools have analysed the reasons which are monetary causes or technology gaps, the current resources are missing from the school study pedagogy, Gonida, E. & Iossifidou, V. (2008) and (McKenzie & Lounsbury, 2009; Morgan, 2008). With school systems struggling with financial constraints, time constraints, and lack of resources, Nayi Disha could help aid the loopholes and allow the educators to utilize more programmes that make the students physically active with economic study devices which are also easy to use. Nowadays obesity and other health diseases are prevalent due to static body postures. This study has resulted after interviewing 30 parents who are having toddlers. This study provides educators, insight on the effectiveness of Nayi Disha and Kaju and the potential impact the customized study program and pedagogy may have on the students. To investigate the relationship between children’s MMD and their behaviours (play and problem-solving) during children’s motion-based interactions, we employed a multi-step mixed methods approach.

Findings:

My findings are based upon the interviews of thirty parents, but cannot be categorised as a solid conclusion due to lesser number of participants, The analysis projects a bigger effect size for word recall, number recall, it has also highlighted creative vocabulary in some of the cases. There has been a significant growth in terms of memory in conceptual thinking and its visual process, The toddlers have developed word recall, and developed cognitive skills. The mean performance in the assessment of Kaju applications have highlighted the mean performance in pre test cognitive skills and post-test kinaesthetically skills.

Conclusion:

With the above findings, we have concluded that simplified graphics, clear and easy directions may tend to easier adaptations by the toddlers, also increased timing between two acts may

allow the toddlers to understand and react accordingly. The penalties and negative points play a major role in setting the toddlers off game and hence education, so it can be avoided, rather more creative forms of encouragement can interest the toddlers. Also too many mechanics might distract or disinterest the toddlers. Some children love and understand better through kinesthetics, such children might not want to sit and learn, rather they want to experiment and thus articulate their energy, my study concludes that such learning style should be promoted, to make toddlers understand the concepts better.

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