Inspiring Prospective teachers towards Game based Learning

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Abstract:

Teachers are known as literacy designers. They need to design literacy which makes learning encouraging, informative and interactive. It is a big challenge for teachers to transform information consumers to knowledge builders. Game based learning aligns in this direction. Developed nations have included game based learning in their teaching-learning process. Developing countries like India should adapt the promising path of gamification for quality education. Quality teachers are the backbone of education system. Frontiers of education need to be imbibed within prospective teachers. Exploring game based learning process, developing analog games and their tryout at grassroots were the main focus area of this study.

The concept of game based learning was very fresh to the teacher trainees. Lot of brainstorming was done regarding content selection, content analysis, structure of game, administration of game, set of instructions to play etc. Criteria for developing games were improvised analog games, low cost budget, no digital tools and maximum participation in play. Trainees had to create a planning document that answer questions like: What type of game do they plan to create?, How will the particular game satisfy the objective of playful drill and practice in subject like mathematics? How will it be administered in school classroom?. After getting feedback from the group a review game was created. Review game was played by the peer group of game creators as a pre pilot study. Due modifications were made and set of game was ready to be administered in school. Teacher trainees made school students play the game during their internship tenure. Trainees noted their reflection on playtest rubrics. This resulted in the final version product of the game.
On the basis of qualitative data, following outcomes were noted:

Teacher trainee experienced game based learning concept for the very first time and so was with the school students. game based learning approach gave them opportunity to analyze the content very differently. This helped in developing their critical thinking and content mastery. Transfer of training took place when they designed a game. They explored various learning resources to fetch the ideas which boosted their creativity. Collaborative approach and communication skills were at pinnacle due to interactive sessions. Observation skills sharpened and they noted that students were enthusiastic to play. Unknowingly students were exposed to a mathematical concept multiple times but still they were attentive. Game based learning strategy could satisfy the principle of inclusion in class. Few of them could give more creative views for designing the game. Games beyond digital world surprisd them. School teachers acknowledged the novel idea. It was observed that content to creation path nurtured design thinking among teacher trainees.

Keywords: *Prospective teachers, Game based Learning*

1. Introduction

Teachers role remain central in learning. Teachers are considered to be driver of change. High quality teachers are the strongest influence on learner achievement. Quality teachers are the backbone of education system. Vision of quality education can only be realized if quality teachers become a part of the vision. Quality education should start from the grassroots. So frontiers of education need to be imbibed within prospective teachers. It is time for prospective learners and teachers to find themselves outside the formal education structure. However, the question of how prospective teachers will sharpen their skills is largely overlooked.

Coming to Indian context, education system lags behind in imparting quality education. Preparing learners for work, citizenship and life in 21st century is daunting. To overhaul education system steadfast policies and action plan have to be designed in terms of delivery of knowledge and measuring learning outcomes. Teachers at grassroots need commitment towards quality education practices. Rigorous teachers training module encompassing modern pedagogical paradigms for the development of critical skills, collaborative approach, communication skills is need of an hour.

Various interactive pedagogies are practiced to engage and motivate students in learning process. The aim of the current study is to inspire prospective teachers to incorporate interactive pedagogy in the subject like mathematics teaching. The objective was to provide an opportunity for teacher students to

- explore the practical design and try-out of a game in classroom settings
- Observe how students respond to game play.

2. Why Game Based Learning (GBL)

Teachers are known as literacy designers. They need to design literacy which makes learning encouraging, informative and interactive. It is a big challenge for teachers to transform information consumers to knowledge builders. Any instructional strategy adopted or adapted by teachers should majorly address the diverse learning style present in the classroom. Developed countries have already transformed their pedagogy in interactive form but we are in the very initial phase of this situation. Teacher education being a training course is still in a theoretical mode. Teacher education was reported as both a facilitator and a barrier to achieving the implementation of promoted pedagogies. (Westbrook & Durani, 2013). There were five factors that prevented teachers from implementing effective practice, often the inverse of those favorable factors: misalignment of initial teacher training with school curriculum; misalignment of continuing professional development with the promoted pedagogy; limited resources and large class sizes; curriculum and assessment; and poor communication with the community and policy makers. (Westbrook & Durani, 2013). As literacy designers, student centric pedagogy should be practiced in teacher training institutes.

Games in classroom have always been an integral part of child life. Games are always motivating, engaging and enhance competitive spirit. Game based Learning as understood is integration of games or gaming mechanics into educational experiences" (New Media Consortium, 2014) is a promising instructional approach for advancing student learning in varied academic domain (Young, et al., 2012). Use of Game based Learning is a promising path to enhance science, technology, engineering and mathematics (STEM) teaching. Game based Learning is different than passive learning or content fed learning. As argued 21st century education needs to be far ahead then simple blackboard teaching and rote learning. It is very much needed that pedagogy should promote critical thinking and collaborative approach among learners.

In Game based Learning environment, learner's progress is directly related to their understanding of subject. Game based Learning has significant impact on retention. Learners are more engaged with subject matter because it makes learning fun. Game based Learning is directly associated to achieve specific learning outcome. Measuring learning outcomes has a novel dimension rather than just the measure of regurgitation of content swallowed by rote learning.

Game based Learning is used
- To reinforce concepts learned in class
- To create greater engagement with subject
- To develop multiple methods of approaching curriculum and content

Game based Learning enhances to support learning environment at two stages: Game creation and Game play.

Game creation as a pedagogical strategy contains many characteristics of knowledge constructivism. Due to lack of competency, game creation experience multifaceted barriers. These broadly focus on teacher's ability to innovate-create and incubate. However, there is a need for empowering teachers with the pedagogical competence for integrating games into classrooms.

3. Game creation as an instructional strategy
Sophisticated game created by others limits the player in being passive players. By allowing students to create the games to be played, teachers can create a fully situated learning environment (Matinez & Stager, 2013).Present learners are digital natives. Abundant digital games and tools are available in the present technology saturated society. Observing the socio-economic strata of learners in classroom and availability of resources in school it was predefined that prospective teachers will design analog games having low cost. No digital game will be designed. Improvisation of games will deal with the content analysis developing analytical skills and critical thinking. Creativity will be at pinnacle and innovative ideas will altogether open new avenues for prospective teachers. After executing in-depth brainstorming sessions with prospective teachers regarding importance of game based learning following steps were followed for game creation:

4. Steps of Games Creation
Step – 1 Identify content and do content analysis.
Step –2Decide the type of analog game to be design. Game based Learning has various formats like board (analog) games, card games, word games, puzzle, etc.
Step – 3 Create a planning document that answers following questions:
- What will be the learning outcomes by the selected game design?
- What will be the game design for the selected content?
- Why this design has been selected?
- What will be the rate of class participation during game play?
- What will be the brief outline for the administration of the game in classroom situation?
- What will be the timeline of game creation?

Step-4 Planning document to be discussed among peer group of prospective teachers and feedback is to be obtained. Necessary changes are to be incorporated in planning document if needed.
Step-5 As per the planning document game creation is the next task.
Step-6 Experience the game as players. Have a play test of the game in the peer group of prospective teachers.
Step-7 Get feedback. Note down the reflection in context to play test rubrics.

Playtest Rubrics

Category	Did not meet the standards (0)	Met the standards (1)	Exceeded the standards (2)
Content analysis			
Game design			
Cost effectiveness			
Rule book			
Administration process			

Step-8 After the pre pilot tryout in the peer group, prospective teachers have a tryout with school students. During the internship tenure trainees were asked for the pilot tryout. Their reflection in context of play test rubrics are to be noted. Modification in terms of questions, rule book or administration process was to be done.

Step-9 Preparation of final version of game.

5. Outcomes of Game based Learning strategy

On the basis of qualitative data, learning outcomes were noted. In the present study there were two stakeholders as game consumers- Prospective teachers and school students. Game building and playing led to game based learning for both prospective teachers and school students.

Prospective teachers: Teacher trainee experienced game based learning concept for the very first time. Game based learning strategy gave them opportunity to analyze the content very differently. It was an opportunity to explore curriculum in a very novel way. This helped in developing their critical thinking and content mastery. Transfer of training took place when they designed a game. Trainees developed analog games like crossword puzzle, Housie, Snakes and Ladder, Mathopoly, card games etc. It was planned to design games which they did play conventionally. It was a very different experience to put content in the form of games which they had played just for fun till now. They explored various learning resources to fetch the ideas which boosted their creativity. Collaborative approach and communication skills were at pinnacle due to interactive sessions. Administration of game in schools helped them in enhancing communication skills. Observation skills sharpened and they noted that students were enthusiastic to play. Unknowingly student teachers were exposed to a mathematical concept multiple times but still they were attentive. Peer group learning was at peak. Game based Learning strategy was applied for mathematics and science subject teaching and it stimulated other subject trainees too. They were also excited to incorporate games in their curriculum delivery. This experience in the institute was very satisfying and reflected the power of games in curriculum transaction.

School students: Students experienced game based learning concept for the very first time. It was a very exciting and engaging experience to school students. They were eager to have game sessions. Unknowingly students were exposed to a mathematical concept multiple times but still they were attentive. Students were able to give innovative designs for game building when they were involved in game creation. "Thinking out of the box" philosophy helped in enhancing creativity and involvement with the subject. Game play provoked creativity and collaborative approach among students. School students being digital natives were amazed to have the experience of analog games. It broke the monotony of the digital games. While conducting the game play sessions, trainees observed that school students who were less attentive and interactive during regular content teaching were much involved in the subject with full potential. So Game

based Learning pedagogy could influence varied learning styles present in the class. Inclusive education viewpoint did have positive influence through Game based Learning pedagogy. Students were found to be more disciplined and self driven during the game play. They started using their free play time in a fruitful manner.

Ecological conditions: Teachers experienced technological, organizational and cognitive issues regarding use of interactive pedagogy. They had very modest idea of Game based Learning pedagogy. Ecological conditions were never such created to practice pedagogy other than chalk and talk. Teachers reported limited use of games due to pressure of content coverage, lack of resources, inadequate digital facility and undue stress on preparing students for high stake testing by rote learning. They were very pleased to see analog games which almost had nil requirements in terms of technology and infrastructure. Self content set of games, cost effectiveness and no special needs of infrastructural facility motivated teachers towards games. Creative ideas were suggested by experienced teachers which made this study a bipolar learning process for students and trainees.

6. Implication and Conclusion

The objective of this study was to educate pre-service teachers in the knowledge and skills essential for game development and its administration in classroom setting. Study focused in developing analog games and generating game based resources which can be promoted as open educational resources.

Teacher education in game based learning is in its infancy particularly at pre service level (Franklin & Annetta, 2016). Researchers need to continue focusing in the nascent area of teacher education for at least three reasons: First, quality education demands active participation of learners in learning process. Information consumers are to be transformed into knowledge builders. Prospective teachers need to enhance their proficiency in this direction. Second, pre-service teacher's competency in adopting game based learning as an instructional approach will enhance their 21st century skills. Skilled prospective teachers will be the asset of education system and play pivot role in building favorable ecological conditions. Third, studies in various school subjects will benefit leaner fraternity in holistic manner. Barrier of inadequate resource will overcome which will boost the usage of games in learning process.

The current study had small sample size of thirty prospective teachers. This study should be replicated over a longer period of time and increase in sample size by involving prospective teachers of various subjects. Subsequently, the long-term impact of training on prospective teachers and how many prospective teachers go on to actually incorporate game based learning in their actual classrooms is worth studying.

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