



## Teachers' Views on Game-based Learning (GBL) as a Teaching Method in Elementary Level Education

\*Mrityunjay Jana

\*Department of Education, North Orissa University, Baripada, India

Subrata Kumar  
Aru

Department of Education, Kolkata, University of Calcutta

Papiya Dutta (Ray)

Department of Education, Mrinalini Datta Mahavidyapith, Kolkata, India

Nityananda Sar

Department of Geography, North Eastern Hill University, India

### ABSTRACT

*Our present paper emphasise on game based learning (GBL) which can help students to improve problem-solving skills and make it possible for them to interpret their society, nature and the world around them through long term experiences. Actually, games provide information in a relevant situation or setting. So far it is very important for the social studies courses, in-class leisure activities, games, physical activities and extracurricular activities which aim to train students as active members of a classroom all over world. Using games in courses encourage reflection and comprehension of the learning. The purpose of this study is to understand elementary school teachers' views on GBL related to elementary school courses. 30 elementary school teachers from the schools located in districts with low, middle and high socio-economic levels in Paschim Medinipur participated in this qualitative study. The data has been collected by using semi-structured interviews and analyzed using descriptive analysis in the study area. The findings of the study, the elementary school teachers believe that content of the social studies course; in-class leisure activities, engaging child literature, games and physical activities were suitable for using GBL in the classroom. GBL activities were exemplified as e-learning activities, creative drama activities, digital games, values education and character education. Teachers experienced problems about time planning, students' non-cooperative behaviours, and teachers' insufficient background about organizing and designing games as well as economic problems and technical obstacles in related to GBL. This qualitative study could help our society by improving educational development.*

**KEYWORDS :** Digital games, Elementary School, e-learning, GBL, Encourage reflection, Semi-structured interviews

### 1 Introduction:

Now we experienced game-based learning (GBL) gained a greater importance in Indian society. This is known to all that a game has an important role in a child's world in all society. Theoretically learning is an internal process and that's why games are natural learning instruments in a child's life way. Different types of games help students develop necessary knowledge, skills and values in order to be an active member of their classroom and even in their societal environment. In this point of view, teachers have a crucial role on students' learning process with games way. So, teachers choose appropriate games related to their teaching goals and when they organize GBL process effectively, permanent learning can be provided, courses can be found enjoyable and interesting by the students or learners (Gözütok, 2000, Hainey, 2010, Ketelhut, 2011, Pivec, 2004, Tzuo et al. 2012). That's why, students who are from elementary schools, have difficulties to concentrate abstract concepts. That's why educational games are usually prepared for elementary level learners (Sevinç, 2004, Ebner et al. 2011, Karadag, 2015, Squire, 2003, Shah et al. 2014). Finally, games are based on student-centered education approach, students learn by doing and experiencing with interactive practices in our society. Actually, GBL represents a good instrument for fostering creative teaching practices in teaching learning process. In reality, the literature demonstrate that games have qualities that can facilitate student learning by providing challenging experiences that promote intrinsic satisfaction and offer opportunities for authentic learning by enabling learners to freely explore the environment in a risk-free environment of our society (Frossard, Barajas & Trifonova, 2012, Li et al. 2012, Liu, 2009, Liao, 2010, Perrotta, 2013, Romero, 2012). It is combined with educational and information technology of recent years. The e-learning becomes more popular, the GBL is applied more and more in learning process. In this method of learning, the course content is mapped into the game to provide a virtual environment of learning, the repeated self-learning, and the ongoing interaction and feedback can increase the learning interest and motivation in teaching learning process. Therefore, GBL could reach the goal of learning effectively in method of teaching (Ching and Chung, 2012, Hsu et al. 2008, Marty and Carron, 2011, Yen et al. 2011). Along with, it provides authentic tasks

and environment, both challenges and supports the learner's critical thinking processes, and encourages trying out alternative views or methods without substantial risk to the player or learners (DeKanter, 2005, Razak et al. 2012). Highlighted content of the elementary education courses reflects life of students. That's why; it should be based on real life of learners. Game Based Learning may influence students' perceptions towards the courses positively in case of learning environment. Finally, game activities may help students transfer their knowledge to real life situations in our society. This awareness of elementary school teachers about using games as a teaching method is very important now a days. Teachers are expected to organize GBL activities and to compose games to support effective teaching in the elementary education in recent study. Along with, teaching processes involving games designed by teachers appeared as a stimulus for teachers and students, both in terms of learning outcomes and motivation for both case. Different types of games also supported a creative learning environment, in which questions and humor were encouraged in respect methodological view (Frossard, Barajas & Trifonova, 2012, Wang et al. 2010). The method is based on five major dimensions that contributed to the game-based learning efficiency of the students are identified as: learning environment, learner, pedagogy, context, and teacher. Learning efficiency was divided into three domains: affective, cognitive, and psychomotor in learning environment (Chang, Wu, "n.d.," Cheng et al.2012, Cheng et al. 2013). Along with Learners' experience and play time also play a critical role in the success of the GBL efficiency of the students. Interpretation from the game design strategies should inspire the experiential learning to generate a positive effect in players, and students can be engaged and motivated through direct experiences with the game world (Chang and Wu, "n.d.," Chang and Chou, 2008). This is clear to all that using such an important method in education will be more effective. Actually, children like games and spend most of their time playing with them, games happen to be used in education. This study aims at understanding how elementary school teachers perceive GBL and to collect their views about advantages and problems of GBL.

**2. Materials and Method:**

The data were collected via semi-structured interviews from specified field. An interview schedule was prepared by the researcher for collecting data. One the interview form was examined by field experts, their recommendations were considered. After the review of the form, a pilot interview was conducted. Scheduled questions were redesigned after the pilot interview and the final version of the form is created in written mode. All researchers explained the purpose of the research to each participant one by one, and asked them to sign a personal permission document before the interviews situation. Pre planned interviews were conducted in the spring term of 2013-2014 academic years in different time frequency. Study group included a total of 30 teachers from elementary schools in different blocks of Jhargram, Paschim Medinipur of West Bengal state. Variation was maximum in the time of sampling (Yıldırım & Şimşek, 2006) was used to select teachers who would be willing to participate in the recent study. Selected criteria determined by the researcher included teachers' years of teaching and different socio-economic status of the study site. Equal number teacher were chosen from districts with low, middle and high income levels Descriptive analysis method was used to analyze the collected data. A simplified framework was formed in research questions and themes were described to organize data. Audio-records of the interview were transferred to the computer from digital sound recorder and transcribed by the researcher in the time of analysis. All participants were assigned code names and their code names were recorded in list. Analyses of the collected data were done by the researcher and another field expert independently. Then, researchers exchanged their ideas and reached an agreement on the points they had differing views about. Reliability of the study was calculated with the use of Agreement/ Agreement + Disagreement X 100 suggested by Miles and Huberman (1994) and the reliability of the study was found 92% (Yıldırım & Şimşek, 2006). The qualitative research methods were used in our recent study. Interviews give information about individuals' experiences, beliefs, values, knowledge and their perceptions about acts and cases in this situation (Yıldırım & Şimşek, 2006). Finally elementary school teachers' views on GBL were explored through semi-structured interviews in this study of qualitative research.

**3. Findings:**

Over all findings which were obtained by analyzing the data were presented in this section of study. All themes which were based on the opinions of teachers were given separately in the tables given below. Themes were listed according to teachers' responses which were stated from most to least regionally to fit whole method.

**Table 1 Elementary School Teachers' Definitions on GBL**

Low Socio-Economic Levels	Learning from media, computers
	Sub-branch e-learning
	Social Learning
	Active learning
	Learning from educational games
Middle Socio-Economic Levels	Interactive Learning
	Learning by doing, experiencing
	Cooperative Learning
	Improving Strategies
	Improving problem solving skills, problem based learning
	Learning from media, computers
	Using Critical Thinking
Learning by doing, experiencing	
High Socio-Economic Levels	Learning from experiences
	Implementations on Drama, Creative Drama
	Learning with fun

In the above Table 1 elementary school teachers develop different understandings for GBL. Most of teachers who participated from schools in middle and low socio-economic level, defined GBL as learning by doing, experiencing whereas many of teachers who were from schools in low socio-economic level defined GBL learning from media, computers and sub-branch e-learning of learning process. Participants stated that GBL was based on active learning and student-centered approach in teaching learning process. In this case one participant commented that "Actually games are very important to activate students in the classroom of the study field. They enhance

their problem solving skills and their strategic thinking skills, in a word, GBL support student-centered approach. Both they are satisfied with learning with fun and they have motivation for learning more."

**Table 2 Opinions of Elementary School Teachers about GBL as a teaching method**

Low Socio-Economic Levels	Students feel happy for being active in the game
	Suitable for all courses as a teaching method
	Reveals the need for more resources
	Requires digital self-efficacy and computer self-efficacy requires to use game
	Supporting permanent learning
Middle Socio-Economic Levels	Increase students' motivations and their interest about courses
	Effective method to improve language skills
	Suitable for all social studies courses as a teaching method
High Socio-Economic Levels	Not Convenient for Measurement and Evaluation in courses
	Games take so much time in the learning process.
	Construction a link between courses and social life
	Suitable activities for outdoor education
	Reveals the need for more resources (education tools, ground etc.)
Not Convenient for Measurement and Evaluation in courses	

It is clear from Table 2 that many of teachers who were from schools in low socio-economic levels expressed that GBL was suitable for all courses as a teaching method and it made student feel happy in the learning process. Most of teachers who were from schools in middle socio-economic levels stated that GBL supported permanent learning and increasing students' interests and motivation. A major part of teachers who were from schools in high socio-economic levels pointed that using games took so much time in the teaching and learning process. Some teachers also expressed that GBL was Construction a link between courses and social life. One participant commented on this issue as, "Games prepare students for social life and society. Students are actors and actresses in the classroom while games are set into motion."

**Table 3 Elementary School teachers' views about activities implemented GBL for the courses**

Low Socio-Economic Levels	Educational games
	Creative Drama
	Puzzle
	Role playing games
	Card games
Middle Socio-Economic Levels	Word games
	Competitions
	Sport activities
	Educational games
	E-learning activities (computer games, video games and other digital games)
	Using puppets and masks
	Role-playing
	Quizzes
Sport activities	
High Socio-Economic Levels	E-learning activities (computer games, video games and other digital games)
	Flash cards for concept teaching
	Traditional children games
	Cooperative games
	Lego,tangram,Quizzes

Table 3 explains that half of participants who were from schools in low and middle socio-economic schools explained that they used educational games, e-learning games, role-playing games. Nevertheless all participants who were from schools in high socio-economic levels also explained that they used e-learning activities (computer games, video games and other digital games), they needed multimedia materials and they considered themselves in sufficient how to use and

develop multimedia materials. They also pointed that they prefer to use traditional children games because of lack of multimedia materials.

#### 4. Result and Discussion:

Results of the study revealed that teachers understand GBL as learning from media and computers, using educational games through social learning, cooperative learning of learning environment. Argued should be made that teachers' definitions from low and middle socio-economic status schools regarding GBL overlap much more with the literature subject. Game Based Learning can be defined as learning about learning by doing and cooperation in social medium processes to acquire knowledge, skills and to make students to be active in the recent situation (Squire, 2003). All teachers from high socio-economic status schools defined GBL as learning from experiences have gained. It may say that this stems from the lack of teachers' knowledge and experiences on GBL's scope and its principles of learning. GBL methods can be implemented in the elementary school courses from the viewpoint of teachers of the study site. All teachers explained that students feel happy for being active in the game and games are suitable for all elementary school courses as a teaching method. Basically, teachers used learning with games in physical education and its activities, social studies, children's literature. In that case game-based activities were listed as e-learning activities, educational games, role playing and creative drama. Along with they expressed that games are constructing a link between courses and social life and support permanent learning, students feel happy for being active in different types of game. Result shows that the GBL system obviously improves the learning achievements of students or learners. In case of long-term learning, the application of the GBL system to a classroom environment is both feasible and useful for applicability. In upcoming work, we expect to make more use of multimedia features to enrich the graphics and contents of the game, in order to improve the learning motivations of students (Ching and Chung, 2012). Teachers depicted that they use outside activities mostly in teaching games and physical activities, social studies. Teachers from different schools located in middle socio-economic level districts stated that they use GBL activities in subjects about supporting permanent learning, increasing students' motivations and their interest about courses of study. All teachers from schools located in low socio economic level districts indicated that they use in leisure time activities, mathematics education (it is as an introduction activity in the learning process), social studies or social sciences. Using games in "leisure time activities" and in "games and physical activities" encourage reflection and comprehension of the learning. Leisure time activities were started by the Turkish National Ministry of Education via promulgation in 2010 for the students attending from the 1st to 5th grades of elementary schools. Moreover Games and Physical Activities were started in 2012 from the 1st to 4th grades of elementary schools. These activity lessons help in order to engage learners considerably (Ministry of Education Turkey (MEB), 2012). On the other hand, teachers from low social-economic level schools told that games take so much time in the learning process. It can be said that games take too much time because of students' academic and developmental differences. Besides that, teachers experienced problems about time, students' behavioural problems, and incapacity of game organizations and reluctance of students in order to participate. The results of the study showed that organizing time is one of the important problems faced with by teachers. It can be claimed that teachers from schools located in high socio-economic level districts point problems in GBL process. Güneş (2010) states that outside learning activities should be planned practiced and evaluated carefully to be effective. Teachers from schools located in middle and low socio-economic level districts mentioned the problems about the preparation and planning stages of the outside learning as economic problems, family cooperation and organizational problems. Similarly, the main problems about using games in the class-time are defined as lack of preparation time, poor technical support, outdated technologies and lack of opportunities for collaboration due to the rigid structure and time constraints of formal instruction (Perrotta, Featherstone, Aston & Houghton, 2013). It can be said that all stages of learning with games should be handled in planning practice and evaluation process in detail and necessary measures should be taken to solve the problems. Teachers put forth suggestions for the problems about GBL such as designing games considering students' interests and abilities, strengthening elementary school teachers' self-efficiencies on GBL, organizing extracurricular

activities to use games much more in the classroom. Regarding the findings of the study and from teachers' ideas on suggestions, following suggestions also can be made; in service training regarding the purpose, scope, planning, practice of GBL for elementary education can be organized for teachers. Game-based activities should be given in different curricula and course books. Especially, schools located in districts with low and middle socio-economic status can be supported financially to get more resources. School managers and parents can cooperate with teachers for organizing GBL activities. Helping teachers understand how to use these new pedagogies is important. Successful professional development requires attention to multiple factors including teacher efficacy in using the software, pedagogical issues and school culture (Ketelhult et al. 2011). Moreover, the learner-centered game design methodology appears as a productive and creative approach for teaching and learning, along with difficulties. But, it is worth to explore if we want to promote creative teaching and creative learners (Frossard, Barajas & Trifonova, 2012). Skills which were emphasized in elementary school curriculum such as student-centered approach, social participation, using information technology, problem-based learning, using new strategies experiences, (MEB, 2005, MEB, 2012) require GBL and using games in the learning environments. It is obvious that interest in GBL for elementary education is growing. Thus, helping teachers understand how to use these new pedagogies is not only important but also crucial.

#### 5 Conclusions:

On the basis of above results it could be concluded that traditionally, technology used in school operates usually to solve problems in a fun way, particularly in mathematics. They usually make up case studies designed to introduce students to certain technologies in an effort to prepare them for a future major assignment that requires the aforementioned technology. They have also been developed to work in the virtual world. More recently educational e games have been developed for Higher Education students, combining real world case studies in a virtual environment for students to have a consistent, 30/7 educational 'virtual' experience. In the future, technology and games are expected to be used in simulation environments to simulate real world issues. In the professional sector, such as flight training, simulations are already used in an effort to prepare pilots for training before actually going out into planes. These training sessions are used to replicate real life stresses without the risk factor associated with flying. Simulation-games are used in other professional areas as well; a spy-themed learning game has been used to improve sales skills at *Avaya* and a 3D simulation game has been used to train New York City emergency responders. Before deciding how to use game-based learning, the trainer must first determine what they would like the trainees to learn. A trainer that fails to focus training around a central idea runs the risk of using a game that fails to connect with the learners. To prevent this, tailor the material to the demographic (age group, familiarity, educational pre-text) so that the material is neither too difficult for, nor too familiar to the learner. Gathering ideas from children early in the design process has yielded useful insights into what children want in technology in general or in a specific type of application. Children's early involvement in requirements gathering has revealed clues about gender differences in preferences related to technology, children's navigation skills, ways of presenting textual information, application-specific content-related preferences, the variety of elements to be included in user interfaces and their structures, and children's desire to personalize their applications. Multiplayer role playing games (MMO's) provide opportunities for players to improve such skills as, "complex learning, thinking, and social practices". MMO's also provide a social network which can favor collaborative gaming and learning and contribute to the formation of teams, communication within a group and help strengthen individual and communal identities.

## REFERENCES

- Chang, S., Wu, C., T. ("n.d."). Meta-Analysis of the Critical Success Factors for the Students' Game-Based Learning Efficiency. Unpublished manuscript. From <http://120.107.180.177/1832/9901/099-1-16p.pdf> on May 1, 2014. Cheng, C., H.; Chung, H., S. (2012). A Game-based learning system for improving student's learning effectiveness in system analysis course. *Procedia - Social and Behavioral Sciences* 31, 669 – 675. Cheng, Y. M., Lou, S. J., Kuo, S. H., & Shih, R. C. (2013). Investigating elementary school students' technology acceptance by applying digital game-based learning to environmental education. *Australasian Journal of Educational Technology*, 29(1). Chang, W. C., & Chou, Y. M. (2008). Introductory C programming language learning with game-based digital learning. In *Advances in Web Based Learning-ICWL 2008* (pp. 221-231). Springer Berlin Heidelberg. DeKanter, N. (2005). Gaming redefines interactivity for learning. *TechTrends: Linking Research & Practice to Improve Learning*, 49(3), 26-31. Ebner, M., Böckle, M., & Schön, M. (2011, June). Game Based Learning in Secondary Education: Geographical Knowledge of Austria. In *World Conference on Educational Multimedia, Hypermedia and Telecommunications* (Vol. 2011, No. 1, pp. 1510-1515). Frossard, F., Barajas, M. and Trifonova, A. (2012). A Learner-Centred Game-Design Approach. Impacts on teachers' creativity. In: *Digital Education Review*, 21, 13-22. [Accessed: 25/05/2014] <http://greav.ub.edu/der> Gözütok, D. (2000). Öğretmenliği Geliştiriyorum, Siyasal Yayınları, Ankara. Hainey, T. (2010). Using games-based learning to teach requirements collection and analysis at tertiary education level (Doctoral dissertation, University of the West of Scotland). Hsu, S. H., Wu, P. H., Huang, T. C., Jeng, Y. L., & Huang, Y. M. (2008, November). From traditional to digital: factors to integrate traditional game-based learning into digital game-based learning environment. In *Digital Games and Intelligent Toys Based Education, 2008 Second IEEE International Conference on* (pp. 83-89). IEEE. Karadag, R. (2015). Pre-service Teachers' Perceptions on Game Based Learning Scenarios in Primary Reading and Writing Instruction Courses. *Educational Sciences: Theory & Practice*, 1, 185-200. Ketelhut, D. J.; Schifter, Catherine C. (2011). Teachers and Game-Based Learning: Improving Understanding of How to Increase Efficacy of Adoption. *Computers & Education*, v56 n2 p539-546 Feb 2011. Li, K. H., Cheng, T. F., Lou, S. J., & Tsai, H. Y. (2012, March). Application of Game-based Learning (GBL) on Chinese language learning in elementary school. In *Digital Game and Intelligent Toy Enhanced Learning (DIGITEL), 2012 IEEE Fourth International Conference on* (pp. 226-230). IEEE. Liu, G., Jiao, Z., & Liu, S. (2009, March). Tutoring strategy study on game-based experiential learning in vocational school. In *Education Technology and Computer Science, 2009. ETCS'09. First International Workshop on* (Vol. 3, pp. 1043-1046). IEEE. Liao, Y. K. (2010, March). Game-based learning vs. traditional instruction: A meta-analysis of thirty-eight studies from Taiwan. In *Society for Information Technology & Teacher Education International Conference* (Vol. 2010, No. 1, pp. 1491-1498). MEB (2005). İlköğretim hayat bilgisi dersi öğretim programı. Ankara: Devlet Kitapları Müdürlüğü Basım Evi. MEB (2012). Oyun ve fiziksel etkinlikler dersi öğretim programı. Ankara: Devlet Kitapları Müdürlüğü Basım Evi. Marty, J. C., & Carron, T. (2011). Observation of collaborative activities in a game-based learning platform. *Learning Technologies, IEEE Transactions on*, 4(1), 98-110. Perrotta, C., Featherstone, G., Aston, H. and Houghton, E. (2013). Game-based learning: Latest evidence and future directions (NFER Research Programme: Innovation in Education). NFER. Published in April 2013. Pivec, M. (Ed.). (2004). Guidelines for game-based learning. Pabst Science Publishers. Razak, A. A., Connolly, T., Baxter, G., Hainey, T., & Wilson, A. (2012, October). The use of Games-Based Learning at Primary Education Level Within the Curriculum for Excellence: A Combined Result of two Regional Teacher Surveys. In *Proc. of the 6th Europ. Conf. on Games Based Learning* (pp. 401-409). Romero, M., Usart, M., Ott, M., Earp, J., & de Freitas, S. (2012). Learning through playing for or against each other? Promoting collaborative learning in digital game based learning. *Learning*, 5(2012), 15-2012. Sevinç, M. (2004). Erken Çocukluk Gelişimi ve Eğitiminde Oyun, Morpa Yayınları: İstanbul. Squire, K. (2003). Video games in education. *International Journal of Intelligent Simulations and Gaming* (2) 1. Shah, M., Foster, A., Scottoline, M., & Duvall, M. (2014, March). Pre-service teacher education in game-based learning: Analyzing and integrating minecraft. In *Society for Information Technology & Teacher Education International Conference* (Vol. 2014, No. 1, pp. 2646-2654). Tzuo, P. W., Ling, J. I. O. P., Yang, C. H., Chen, V. H. H., Lau, C. Y., & Shaikh, J. M. (2012). Re-conceptualizing pedagogical usability of and teachers' roles in computer game-based learning in school. *Educational Research and Reviews*, 7(20), 419-429. Wang, H. S., Tsai, S. N., Chou, C. H., & Hung, H. J. (2010, June). The study of motivation and reasoning faculties of Game-based Learning in Elementary school students. In *Education Technology and Computer (ICETC), 2010 2nd International Conference on* (Vol. 3, pp. V3-247). IEEE. Yen, J. C., Wang, J., & Chen, I. (2011). Gender differences in mobile game-based learning to promote intrinsic motivation. *Recent Researches in Computer Science*, 279-284. Yıldırım, A. ve Şimşek, H. (2006). Nitel araştırma yöntemleri. Ankara: Seçkin Yayınları.