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Digital Games for Children with Intellectual Disabilities (CWID): An Exploratory study on Prerequisites

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Abstract: **-** In recent days, the Game Based Learning (GBL) strategy has gained a significant attention, due to its enormous benefits to the users. Also, it provides an efficient platform for the learners to improve their educational skills, practical skills, learning skills etc. Among other types of games, the digital gaming platforms are more suitable for the intellectual disabled students to improve their skills and understanding capability. In the existing works, the different types of research works are carried out in this domain, which are mainly focused on improving the skill set of students with intellectual disability. The purpose of this work is to conduct a detailed study for analyzing the type of gadgets, and game elements required for the Children with Intellectual Disability (CWID). Also, it intends to explore the different types of available digital games associated to the instructional requirements. The present study is conducted with a closed ended questionnaire on a sample of 60 special educators, who handling the children having an intellectual disability. The quantitative result of this study suggests that the digital games can be accessed by the different types of gadgets with all gaming elements. Moreover, the four different types of digital games are available for CWID, which includes Drill & Practice, Interactive Storytelling, Simulation, and Role Playing. This study can be more helpful for the educators to improve the learning ability of children with intellectual disabilities.

Keywords: Game based Learning, Children with Intellectual Disabilities (CWID), and Digital Games.

I. INTRODUCTION

Intellectual disability is a disability characterized by significant limitations both in intellectual functioning and in adaptive behavior, which covers many everyday social and practical skills. This disability originates before the age of 18. (American Association on Intellectual and Developmental Disabilities (AAIDD) 2010).

The intellectual functioning and adaptive behavior (Alonso-Fernández et al., 2019; Tsikinas & Xinogalos, 2019) of a student with an intellectual disability (ID) are limited, and this is reflected in their conceptual, social, and practical skills. According to the American Psychiatric Association, the IQ level of the children having intellectual disability was estimated based on Table 1.

Table 1. IQ test score based on the types of disability

Disability Type	***IQ test score***
Mild	50 to 70
Moderate	50 to 55
Severe	35 to 40
Profound	20 to 25

The introduction of video games (Hardiyanti & Azizah, 2019; Kang & Chang, 2020) into the classroom sparked the development of the game-based learning paradigm, an innovative approach to teaching. Learning games appear to be effective with learners in contexts where general education is being taught. But, the game-based learning (Lan et al., 2018) will be effective for a special education context, particularly for children with intellectual disabilities. The stimulating environment for learning is very important for students with intellectual disabilities which precisely reflects the possibility of using games for educational purposes. Learning based on games can help students with intellectual disabilities to learn new data, learn and develop new skills, acquire life skills, develop social skills and form a way of thinking (Sigh & Agarwal, 2013).

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The Game Based Learning (GBL) (Cano et al., 2018; Kang & Chang, 2019; Pashapoor et al., 2018) is one of the most suitable solution for the children having intellectual disabilities, because which helps to improve their learning outcomes.

Game Based Learning

The game based learning (Noroozi et al., 2020) is one of the innovative approach developed by using various application programs, which helps to enhance the education standard of children having disabilities. Also, it supports the learners to get succeed in learning, which encompasses the activities of competition, engagement, and awards earning. So, the learners are get motivated to accomplish their tasks with the specific goal and target scores. Moreover, the gaming applications (Zhang et al., 2020) encourage and engage the students by providing feedbacks and rewards immediately. The typical game based learning framework is shown in Fig 1.

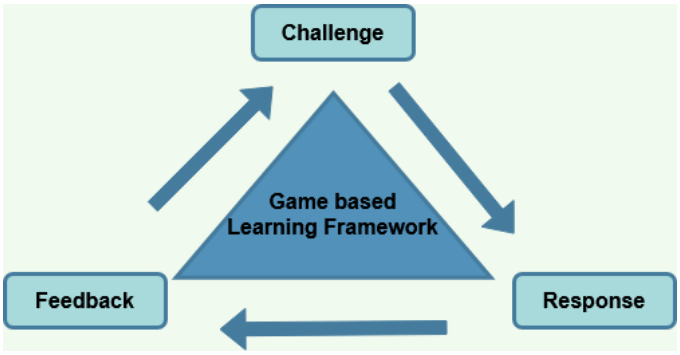

Fig 1. Game based learning framework (Source: Plass, Homer, Kinzer, 2015)

Consequently, it is defined as the designing process of games for learning, which efficiently covers the subjects with the desire to prioritize the game play. Similar to that, the gamification is defined as the incorporation of game elements such as leader boards, badges, point systems and etc associated to the learning activities. It also helps to improve the learning ability of students with proper motivation and engagement. Moreover, the game based learning applications include the following elements:

1. Game mechanics – This is one of the most important game play, in which the single or set of activities are repeated by the learner throughout the game. These activities can have the learning and assessment focus, at some places, it focused on both.
2. Visual aesthetics – It includes the visual elements like overall loos and feel of game, and characters. Here, the visual information is used to determine that how the tools and functions of game mechanics are visualized. It also governs that how cues are repeated and how feedbacks are depicted.
3. Narrative – It is represented as the storyline of game, which can be improved based on the cut scenes, in-game actions, voice-overs, and dialogues.
4. Incentives – It includes some motivational elements that helps to encourage the players to continue their determinations. Then, the proper feedback supports to change their behavior.
5. Musical score – It provides the background sound used to direct the player's attention in some specific events or moments in the game. It convinces the positive/negative emotions, acknowledges the success/failure for the specific task.
6. Content & Skills – It is the final element of learning game, in which the designing of subject matter content and skills are improved for teaching. Also, the different types of learning mechanics are used that holds the visual design, narrative design, incentive system, and musical score.

Moreover, the three different types of game based learning (Caprì et al., 2021; Lan et al., 2018) are developed based on the place, where the game is conducted and the environment that the student play.

- *Board games* – Typically, the monopoly is considered as an education game, which has some necessary elements like story, characters, points, competition, and etc. Some of the other examples for the monopoly games are history monopoly and math monopoly.
- *Real life games* – It is a type of real time environment, which is probably motivating, and a stressful game. In this platform, the student should move, act, use their body, and mind to play the game. Also, it provokes the

students in every aspect of their learning, and enhances the possibility to move into a certain space. Moreover, the real life game is often connected to the theatre, and easy to identify the role play activities, simulations or drama. Here, the students can act the character and makes decisions based on the rules, goals and environment.

- *Digital games* – It can be played in an online environment (Acquah & Katz, 2020; Baragash et al., 2020), and the different types of digital platforms are developed in recent days for game based learning. In which, the teacher can use the online boards to add/edit the education contents according to the topic will be played. In this environment, the students are involved in the construction of game, specifically if the teacher is not able to manage the online tools without their support.

Game Based Learning for Students with Intellectual Disabilities

According to the American Association of Intellectual and Developmental Disabilities (AAIDD) (Amadi et al., 2022; Schalock & Luckasson, 2021), the IQ level of students having intellectual disabilities are relatively low, hence they difficulties in learning. Moreover, the CWID are generally inactive and uninterested in nature, so the games is one of the most suitable solution to make them as more alive and interesting. By using the game based learning strategy, the concentration level of CWID can be significantly improved, because it enables an enjoyable and rewarding activities. Typically, the CWID have very limited ability to explore their feelings verbally, at this case, this kind of learning strategy helps the children to improve their intellectual development. The primary reasons for developing the game based learning are as follows:

- No fear of comparison while playing
- Free to make mistakes
- Space to learn from the mistakes
- No inhibition
- No fear about right/wrong

Due to these facts, the game based learning is considered as the most suitable solution for improving the intellectual development of CWID. Naturally, all children are interested and enjoyed to play any sort of game with high enthusiasm. In addition to that, it served as a perfect frame of mind for learning new concepts and ideas. Moreover, it creates a natural context for enabling a better communication by creating opportunities to learn, practice and skill development. The conceptual framework of the game based learning model is depicted in Fig 2, which illustrates the importance of using the game based learning models for CWID.

Fig 2. Conceptual framework of game based learning methodology

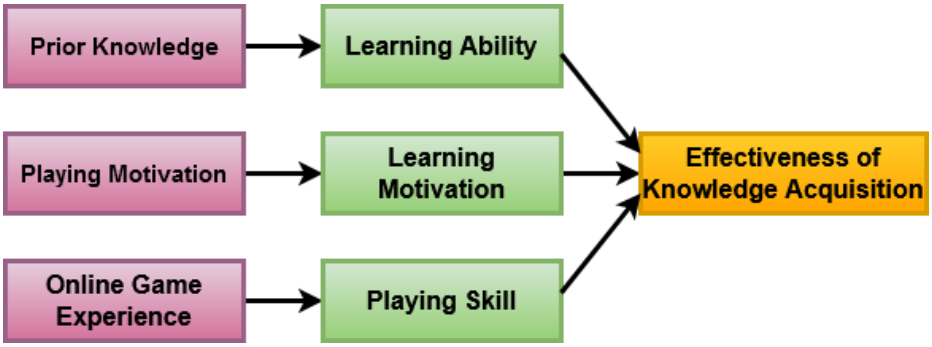

Fig 3. Benefits of using digital games in education

Fig 3 depicts the major effectiveness and advantages deploying the game-based learning education (Flogie et al., 2020; Wuang et al., 2018; Zhonggen, 2019) system for CWID. In addition to that, the gaming requirements, capabilities, and game types are categorized into the following points:

Observing & Imminence – It supports the children to enjoy the gaming, and also it effectively monitors the behavior and abilities of children for helping them, when encountered a hard situation (Ronimus et al., 2019).

Entrenchment & Training – Most of the digital games are rely on the trial and error, where the steps may be repeated for enabling the players to learn the basic skills, advanced skills and educational goals (Terras et al., 2018).

Therapeutic Interpolation & Support – It guarantees the sustainability of children's skills by simply enhancing their leisure with music and graphics (Papadakis & Kalogiannakis, 2019).

Individual Adaptation – Generally, the digital games could fulfill the educational requirements of the children by analyzing their mental and chronological age (Görgen et al., 2020).

Curriculum Localization – Naturally, the digital games are very interactive, which uses the narrative format for teaching the social behavior and surrounding cultural environment to the children (Yu et al., 2018).

Proximity to Real Life Scenario – Most of the digital games in current days are simulated according to the real-life situations, based on the way the ability of players are improved to handle such situations correlated to their real-life with the suitable solutions. For instance, shopping, elegant dress wearing, money making and etc (Bakan & Bakan, 2018; DiPietro et al., 2019).

The purpose of this study is to categorize gadgets, comprehend the game aspects required in digital games for CWID, and investigate the different kinds of digital games that are available in accordance with instructional criteria. The primary research objectives of this work are as follows:

- To identify and analyze the different types of gadgets that are more helpful to the CWID for playing the digital games.
- To study and understand various gaming elements required for playing the digital games.
- To examine the different types of digital games that are increasingly used by the CWID.
- To analyze the instructional requisites of CWID to use digital games.

Moreover, the major research questions focused on this work are as follows:

- What are the different types of gadgets used by the CWID for playing digital games?
- What are the gaming elements can be used in the digital games for CWID?
- What are the different types of digital games currently available for CWID?
- What are the educational requirements of CWID for using digital games?
- What are the practical requirements of CWID for using digital games?

The remaining portions of this paper are segregated into the following sections: Section II reviews the conventional works related to the game-based learning strategies used for enhancing the learning skills of intellectual disability children. The detailed explanation about the research methodology is presented with its appropriate framework model in Section III. The results of this case study are validated and analyzed based on different parameters in Section IV. Finally, the overall paper is summarized with its future work in Section V.

II. REVIEW OF LITERATURE

This section investigates the relevant literature works associated to the game based learning systems for improving the learning capabilities of children having intellectual disabilities. It also examines the problems and challenges faced by the conventional works.

(Saleh & Battisha, 2020) suggested a new paradigm for improving the digital game based learning of intellectual disabled children. The main purpose of this work was to examine the different types of educational requirements used for digital game based learning. It also analyzes the application requirements along with the questionnaire of the instructional design. Typically, the children suffered with an intellectual disability could face difficulties in their communication, social skills, and learning. Also, they required to spend more time for speaking, walking, and self-caring. (STANČIN et al., 2020) conducted a systematic literature review for demonstrating the importance of using digital games. The purpose of this study was to analyze the major impacts of using the game based learning strategy for CWID. Also, it intends to analyze the difference between the intellectual disability and other disabilities according to the skills development. It includes logical skills, academic skills, food skills, socio-economic skills, and professional skills. Based on this study, it was observed that the game based learning could be more suitable for CWID to increase their learning skills. (Breaz & GOIAN, 2019) developed a theoretical framework for recovering the children, who suffered with the intellectual disabilities. Here, an intervention program was also conducted according to the type of games, which supports to increase the learning efficiency of CWID. Moreover, this theoretical framework includes the concepts of etiological theory, symptomatological theory, psychoanalytic, specific syndromes, and integrated theory. (Lamrani & Abdelwahed, 2020) implemented a digital play based learning approach and gamification for improving the skills of children in their earlier education. The foundations of this framework were attention, engagement, feedback, and consolidation. The different types of play supports to improve the learning progress of children are depicted in Fig 4.

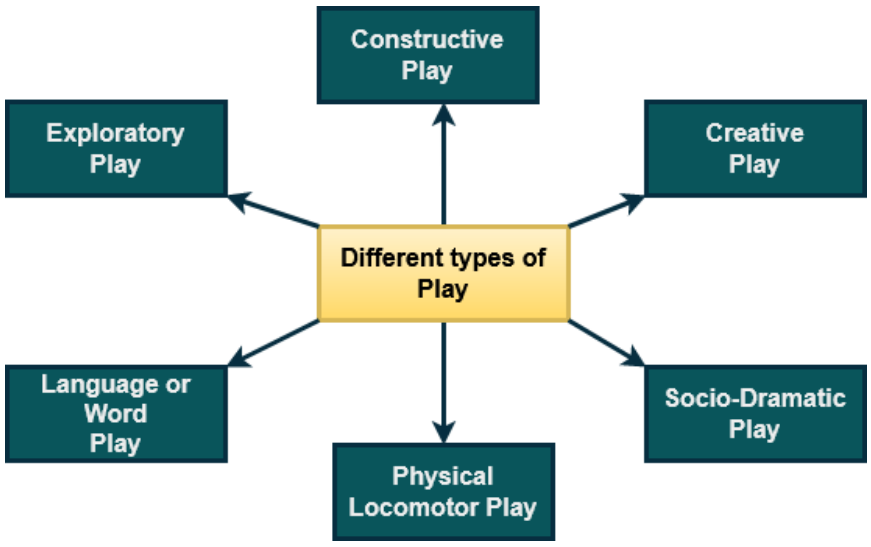

Fig 4. Play in different ways

Moreover, the key benefits of using these digital games were as follows: psychological growth development, imagination ability enhancement, and group interaction. The Gamification helps to transform the activities and services according to the characteristics of gaming elements. This work stated that Gamification techniques were mainly used to enhance the learning process of children. (Pramantik, 2021) recommended a new neuroscience learning methodology for increasing the learning of intellectual disability children. Typically, the neuroscience learning model includes an emotional control, cognitive control, and motor control. (Tsikinas & Xinogalos, 2018) intended to analyze the design guidelines and principles according to the elements of digital games. Here, the conceptual framework was mainly developed to ensure the properties of capability, instructional content, learning activity, reflection, and learning outcomes. Moreover, the four dimensional framework includes the key components of context, representation, learner, and pedagogy. (Yılmaz & Soyer, 2018) investigated the major impacts of physical education and play applications in the school students. The purpose of this study was to present a quantitative research based on the pre-test, post-research and post-test-retention control group for analyzing the social behavior of intellectually disabled children. The different types of interpersonal skills analyzed in this work were self-control, academic skills, aggressive nervous, anti-social aggressive, and destructive demanding. Based on the pre and post test results, the positive and negative ranks are estimated with the mean value. (Rocha et al., 2019) conducted a pilot study for enhancing the learning ability of intellectual disabled children by using the game based technology. Moreover, the multimedia interactive technology was used to improve the learning skills of

intellectual disabled students. In addition to that, the heuristic results were also estimated to solve the minor problems in the user interaction environment. (Bendak, 2018) objects to validate the importance of mobile math games for increasing the skills of mild-intellectual children. Here, the severity level was estimated based on the mild, moderate, severe, and profound disabilities. Also, the adaptive functioning was determined according to the level of support. (Terras et al., 2018) investigated about the different types of opportunities and challenges associated to the serious games for handling the intellectual disabled persons. The purpose of this work was to deliver the reliable and standard education for enhancing the social skills, independency, online safety, and well-being of intellectual disabled children.

According to this review, the importance of using the game based learning methodology is identified for improving the learning and capability of intellectual disabled students. Also, it investigates the benefits and problems associated to the deployment of digital games based education strategy.

III. RESEARCH METHODOLOGY

The following are the work's main research goals:

- To determine which digital games are available and accessible to CWID.
- To examine the CWID's instructional requirements for using digital games.
- To ascertain special educators' overall awareness of the requirements for adopting digital games for CWID.

In the present study, Survey method under Descriptive research design was adopted to know the accessibility and availability of digital games for Children with Intellectual disability. A total of 60 special educators handling Children with Intellectual disability were selected for the present study using purposive sampling technique. The accessibility and availability of digital games for children with Intellectual disability was collected by a survey questionnaire developed by the researcher. The tool comprises of 45 questions, and it is divided into 7 domains. The validity of the tool is tested by getting the feedbacks from experts, and the Pearson’s correlation coefficient is used to estimate the reliability of this tool that is nearly 0.91. Informed consent was obtained prior to the collection of data. The purpose of the study was explained to the respondents. The data was collected and then statistically analyzed.

A. Pre-Requisite Analysis

For the purpose of gathering data for this study, the descriptive research design has adopted the questionnaire approach. The current study looked at the following independent variables: gender, education, experience level, and ICT proficiency. By employing a non-probability selection technique, the researchers chose 100 special educators who work with children with ID from the Madurai district and its surrounding areas. The pre-requisite analysis with different parameters and categories are listed in Table 2.

Table 2. Pre-requisite analysis for trainers

Variable	Category	Frequency	Percentage (%)
Gender	Male	40	70%
	Female	60	85%
Educational Qualification	Diploma/Undergraduate	60	85%
	Postgraduate	40	70%
No of years of Experience	Less than 10 yrs.	50	60%
	More than 10 yrs.	50	60%
Level of ICT skills	Excellent	20	50%
	Good	70	90%
	Average	10	30%

A five-point rating system had been established in order to assess the target groups' accessibility, availability of digital games, and general degree of understanding regarding the requirements for using digital games for CWID. The rating system is divided into five categories: basic knowledge, digital game accessibility, availability, educational requirements, and practical requirements. Nothing changed from one domain to the next. There are 40 items on the scale, five of which are marked as strongly agree, agree, disagree, disagree, and disagree strongly. The scale has been validated against face validity. The following Table 3 gives the pre-requisite for the tool development.

Table 3. Tool development analysis

S. No	Name of the Domain	No of Items
1.	Basic information	10
2.	Accessibility of digital games	11
3.	Availability of digital games	5
4.	Educational requisites	8
5.	Practical requisites	6

Reliability & Validation - When determining the validity of the specific tool, the opinions of 10 professionals who received the tool had been taken into account. The finished product contained changes and suggestions. When the tool's reliability has been evaluated making use of the test-retest methodology, Karl Pearson's Product Moment correlation coefficient value (rvalue), which is highly significant at the.05 levels, was discovered to be.853.

Tool Translation - The instrument has been developed in English and then translated into Tamil, a regional language, keeping the respondents' convenience in consideration.

Pilot Study - In order to make sure the tool is appropriate and relevant, a pilot study has been carried out. The observation showed that the samples responded without any problems at all.

Data Analysis - Both qualitative and quantitative examinations have been carried out on the collected data. The responses to the information gathered have been summed up and determined. With the aid of the SPSS software, a number of descriptive and inferential statistical techniques were applied in order to address the research issues of the current study.

IV. RESULTS AND DISCUSSION

In this section, Research questions framed based on the objectives of the study were answered by analyzing the data collected from the respondents through percentage analysis. The results of the study are validated and analyzed for demonstrating the importance of game-based learning approach for CWID. Also, this study mainly objects to investigate the accessibility and availability of using digital games for the CWID.

RQ1: What are the types of gadgets can be used by CWID for using digital games?

Fig 5 and Table 4 illustrates the different types gadgets used to play the digital games by the CWID, which includes desktop, laptop, tablet, and smart phone. According to this study, it is revealed that the maximum number of respondents support the desktop for playing the digital games, because it could be more convenient for the CWID to use the system and applications. Due to the simple application usage, the desktop and tablet gadgets are highly preferred by the respondents.

Table 4. Types of gadgets used to play digital games

	Items	**N**	**Value (%)**
Types of gadgets	Desktop	42	70
	Laptop	29	48
	Tablet	40	67

	Smart phones	31	52
Game Elements	Game mechanics	35	60
	Visual aesthetics	28	47
	Narratives	26	40
	Incentives	30	45
	Musical score	25	46

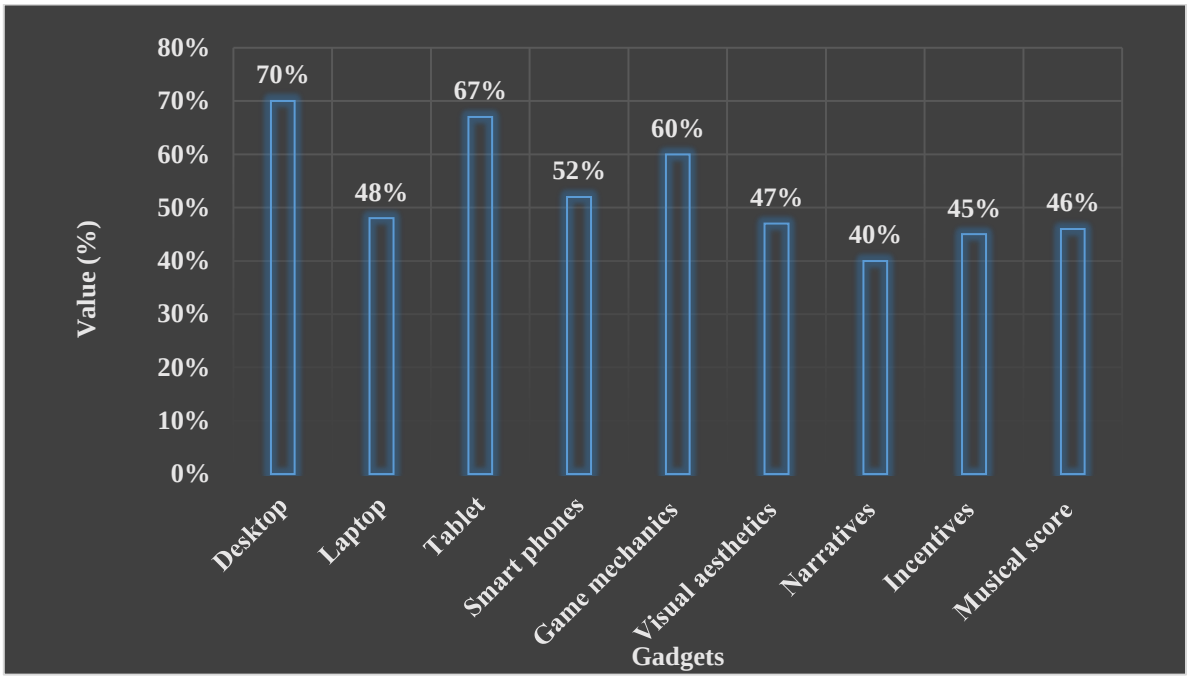

Fig 5. Types of gadgets used to play digital games

RQ2: What are the games elements can be used in digital games for CWID?

Fig 6 and Table 5 depicts the different types of gaming elements used in the digital games for supporting the CWID. By using this analysis, the frequency and percentage values are estimated according to the items of game mechanics, visual aesthetics, narratives, incentives, and musical score. From the results, it is evident that the visual aesthetics and musical score are highly required for playing digital games by CWID.

Table 5. Gaming elements used in digital games for CWID

Items	**Frequency**	**Percentage%**
Game mechanics is needed in digital game for CWID	39	65%
Visual aesthetics is needed in digital game for CWID	54	90%
Narratives is needed in digital game for CWID	48	80%
Incentives is needed in digital game for CWID	48	80%
Musical score is needed in digital game for CWID	52	87%

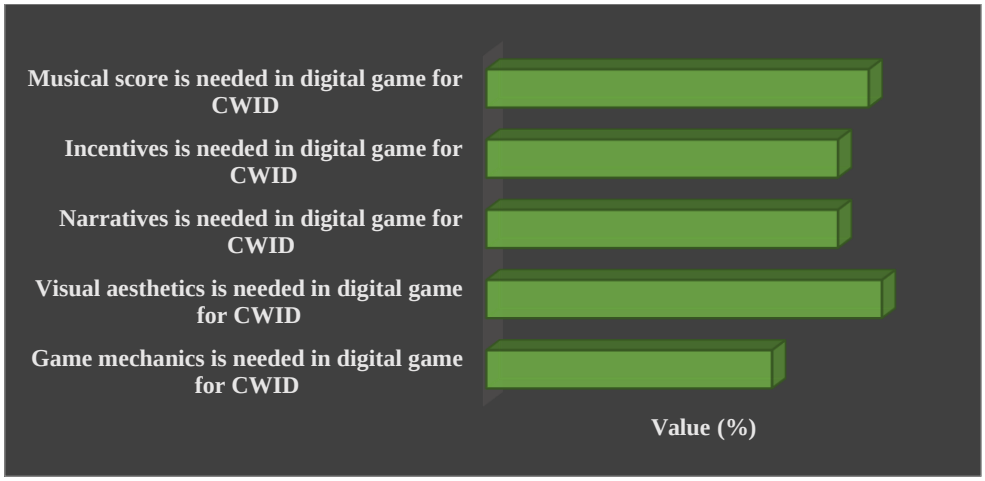

Fig 6. Different types of gaming elements used in digital games for CWID

RQ 3: What are the types of digital games can be used for CWID?

Table 6 and Fig 7 represents the different types of digital games used by the CWID, which encompasses drill & practice, interactive story-telling, simulation, role playing, and adventure. According to this analysis, it is estimated that the drill & practice digital game is highly preferred by the respondents to play, due to its convenience and simple functioning. From the observed results, it is evident that the game based learning strategies are highly accepted by many respondents for improving the abilities of CWID. Moreover, the digital games are rapidly developing in recent days, which could be more helpful and supportive the children/students who having an intellectual disabilities. In addition to that, it gained a positive impact among the respondents for teaching the digital games to the CWID.

Table 6. Types of digital games used by CWID

Type of digital games	N	Percentage
Drill and Practice	58	96
Interactive story telling	55	91
Simulation	55	91
Role playing	55	91
adventure	30	50

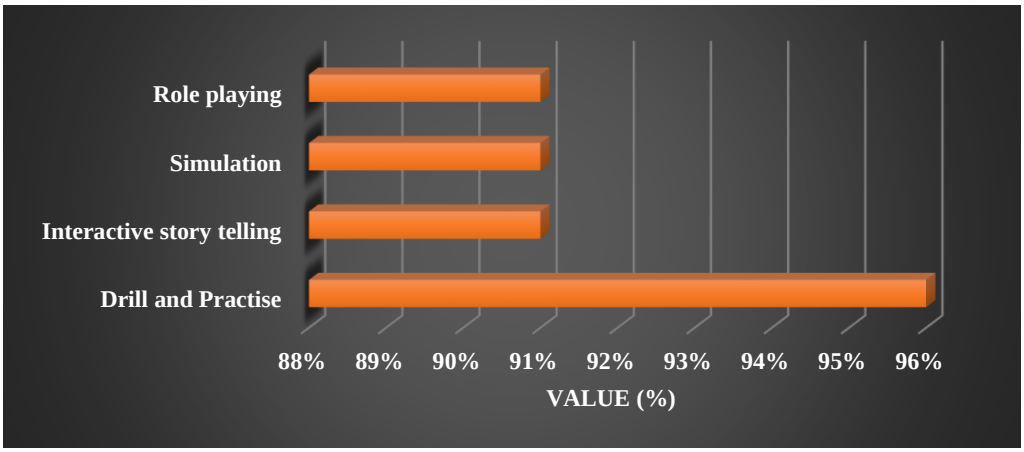

Fig 7. Types of digital games used by CWID

RQ 4: What are the educational requirements of CWID for using digital games?

Table 7 presents the analysis of educational requirements of using the digital game-based learning. For this analysis, the number of respondents is considered are 60, where the evaluation is carried out based on the factors of frequency & percentage, different types of items, degree of response, mean, standard deviation, acceptance percentage and level of acceptance. According to the obtained results, it is observed that most of the respondents suggest developing the digital games according to the level of disability and by properly analyzing the pre-requirements of CWID. It is also evident that DGBL is very important to improve the conceptual, practical, and social skill of CWID. The result implies that designing digital games should be based need of CWID and determining the instructional design of using digital games for CWID is also very essential. Also, while designing digital games the real-world problems & logical sequence of games should be analyzed. Providing immediate feedback to the children when using the digital games, Progressing the skill levels from simple to complex levels, encouraging players by providing incentives according to high level of games are also in the high level of acceptance in the educational requirements of CWID for using digital games. Consequently, the education pre-requisite analysis is conducted with different skills as shown in Table 8.

Table 7. Analyzing the educational requirements of CWID using the digital game-based learning

S. No	Items	Frequency			Percentage	*Level of Acceptance	Rank
		Very Essential	Neutral	Not Important			
1	DGB fulfilled the requirements of CWID	58	2	0	96.67%	High	3
2	Design of digital games with intellectual disability levels	60	0	0	100.00%	High	1
3	Prerequisite needs identification for using digital games	59	1	0	98.33%	High	2
4	Analyzing the real world problems for designing the digital games	55	4	1	91.67%	High	6
5	Determining the instructional design of digital games for CWID	58	2	0	96.67%	High	5
6	Providing immediate feedback to the children when using the digital games	53	5	2	88.33%	High	8
7	Logical sequence analysis of digital games	53	7	0	88.33%	High	7
8	Design of digital games based on the requirements of intellectual disabled children	57	3	0	95.00%	High	4
9	Encouraging players by providing incentives according to high level of games	50	6	4	83.33%	High	10
10	Progressing the skill levels from simple to complex levels	51	8	1	85.00%	High	9

***High – 75%-100%, Average – 50%- 74%. Low- less than 50%**

Table 8. Analysis of education requisites

Educational Requisites	N	Value (%)
ICT skill is required	40	60
Basic gaming knowledge is required	70	90
Analysis of the real-world problems while designing/selecting the digital games	45	75
designing / choosing digital games should be according to the intellectual disability levels	50	80
logically sequence of Digital games	50	80
Progression of skills from simple to complex levels	60	85
providing immediate feedback for the CWID	55	70
providing incentives according to high level of games	65	85

RQ 5: What are the practical requirements of CWID for using digital games?

Table 9 presents the analysis of practical requirements of using the digital game-based learning. For this analysis, frequency & percentage, mean, standard deviation, acceptance percentage and level of acceptance is calculated. According to the results obtained, it is more important to appoint teachers with an increased understanding and knowledge of digital games. Most respondents suggest evaluating the availability of supportive technologies and creating a schedule for using digital games. CWID should also be trained to improve their technical before using digital games. Also, it is high recommended to develop digital games with simple characteristics, easy exit, simple challenges easy to overcome and allowing CWID to cooperate while playing in a real time environment. The digital games developed should support the social contexts and for the learning enhancement of CWID. It is also suggested to develop user manuals for teachers to teach digital games. As a consequence, Table 10 depicts the list of practical pre-requisites for both learners and educators.

Table 9. Analyzing the practical requirements of CWID using the digital game-based learning

S. No	Items	Frequency			Percentage	*Level of Acceptance	Rank
		Very Essential	Neutral	Not Important			
1	Digital games can be developed with simple playing characteristics for CWID	54	6	0	90.00%	High	5
2	Appointing well trained teachers having high knowledge in digital games for teaching CWID	59	1	0	98.33%	High	1
3	Improving the technical skills of CWID before playing the digital games	56	4	0	93.33%	High	3
4	Digital games must be developed with easy exit	52	7	1	86.67%	High	6
5	Analyzing the availability of logical requirements & supportive technologies	58	2	0	96.67%	High	2
6	Reduction of time period allocation	55	5	0	91.67%	High	4

7	Suggesting the user manuals for the teachers to teach the digital games	47	11	0	78.33%	High	9
8	Digital games can be designed with simple challenges that are easy to overcome	51	8	1	85.00%	High	7
9	Allowing CWID to cooperate while playing in a real time environment	46	10	4	76.67%	High	10
10	Design of digital games should support the social contexts for the learning enhancement of CWID	49	8	3	81.67%	High	8

***High - 75%-100%, Average - 50%- 74%. Low- less than 50%**

Table 10. Practical pre-requisite analysis

Practical Requisites	**N**	**Percentage**
Computer lab and network connectivity	45	60
Developing Digital games with simple playing characteristics for CWID	58	75
Digital games can be designed with simple challenges that are easy to overcome	65	82
Digital games must be developed with easy exit	48	65
Appointment of well-trained teachers having high knowledge in digital games for teaching CWID	50	75
user manuals are required for the teachers to teach the digital games	65	80

Table 11. Analysis of awareness among special educator

Variable Name	**Number of samples**	**Minimum score**	**Maximum Score**	**Maximum Obtainable Score**	**Mean**	**SD**
Awareness level of special educator about prerequisites	100	64	200	200	152.23	28.34

Table 11 gives the analysis of awareness among special educators for improving the game based learning strategy.

V. CONCLUSION

The game-based learning is one of the most effective method used for improving the education standard of children having intellectual disabilities. Among other types of gaming systems, the digital games are highly preferred by the experts for improving the abilities and learning skills of CWID. Moreover, the game based learning provides an effective platform for the disability students. The educators are also have an increased ability to teach the gaming according to the requirements and skills of students. The purpose of this work is to conduct a detailed case study analysis for improving the learning abilities and skills of children having intellectual disabilities. Here, the detailed pre-requisite analysis is also conducted in this study for supporting the digital game based learning strategy. In addition to that, it identifies and analyzes the different types of gadgets that are more helpful to the CWID for playing the digital games. Based on this case study, it is analyzed that deploying the practical implementation of digital games is highly essential for CWID. Also, ensuring the utilization of digital games according to the life skills and concepts of CWID is more vital in present days. Moreover, both the parents and teachers should cooperative for supporting the utilization of digital games for improving the learning skills of CWID. In addition to that, designing an appropriate user manuals and handbooks is highly important for the teachers assist their students about the digital games.

In future, this work can be extended by designing digital game for improving the skills of CWID.

Conflict of interest:

The authors declare that they have no conflict of interest.

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Data availability statement:

No data available

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