

Increasing Concentration of Attention Deficit Hyperactivity Disorder (ADHD) Students Through Gamification Learning Media in Indonesian Inclusion Elementary School

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ABSTRACT:

This study aims to determine the patterns of increasing concentration of Special Needs students in Indonesian Elementary Schools. Since these students often have difficulty understanding the educational process, gamification is considered an alternative to improve their learning outcomes and concentration in Elementary School. In this study, a descriptive-qualitative approach was implemented to describe the techniques used by the teacher to improve students' learning concentration in the classroom. A total of 13 participants, consisting of 4 Elementary School teachers, 4 Special Needs students, 4 parents, and 1 inclusion institution principal, were observed and interviewed. Furthermore, data collection techniques included in-depth interviews, Focus Group Discussion (FGD), and classroom observation. The results showed that there was an increase in the concentration of ADHD students after using gamification media in the learning process. The parents of these students provided adequate support, and the principal's policy recommended strengthening parental relationships and using gamification media. These results are expected to be useful for teachers and study experts interested in conducting various analyses on ADHD students.

Keywords: students, special needs, inclusion elementary school, gamification, concentration

INTRODUCTION

Learning concentration is a form of focusing one's thoughts on an object, to sharpen the mind, improve attention, and prioritize specific tasks. In an educational environment, this concentration is specifically employed for students to focus on the studied subjects (Bates, 2019). This process is carried out by excluding all the thinking elements of students toward concentrating and understanding classroom learning materials. When they are fully focused on the studied subjects, a new understanding and knowledge acquisition level is achieved through the materials conveyed by the teacher (Williams et al., 2018). Therefore, this form of concentration is found to highly impact the learning process and students' academic achievement, toward becoming mandatory components in the educational system (Riany et al., 2017; Wicaksana, 2019).

To concentrate on the learning process delivered by the teacher, several factors affecting the focus of students are observed (Sarkadi et al., 2020a; Sarkadi et al., 2020b). These factors include sound, lighting, class environment, social friends, individual psychological condition, and learning motivation. According to some experts, these variables greatly influenced the learning concentration of students, leading to the inclusion or exclusion of academic development information from the quality of the input. Moreover, various causal agents are observed for the difficulties encountered in understanding and concentrating on learning processes, including the lack of interest in the studied subjects. The agents also include weaknesses in the course of study and environmental disturbances, such as noises, very chaotic circumstances, and bad weather. This shows that many determinants are highly observed for the concentration of learning (Arthur, 2019).

Various problems interfering with learning concentration also emphasize students' saturation of the learning models and methods delivered by teachers. Since the learning load obtained by students is very large, the teacher's interruption with similar academic methods and models often leads to inadequate concentration in the educational process. In Elementary Schools, only one teacher is frequently found teaching many subjects, causing the need for various academic processes for the improvement of educational procedures (Clausen et al., 2019; Prevatt et al., 2017).

Elementary school students are considered individuals with disorders in learning concentration. This is because some of their tasks were to think and train learning

concentration toward undisturbed academic performance and educational innovation from study materials, according to several experts. For example, students need to practice concentration measures when learning mathematics, language, social science subjects, etc. Since they have disturbances in academic focus at the elementary stage, their thinking abilities frequently encounter difficulties during the learning process (Dunn, 2019; Everett & Oswald, 2018). When the function of concentration has limitations, students are commonly found to encounter learning process difficulties at a higher academic level. This negatively impacts future development in completing tasks and learning achievements toward career preparation and goal actualization (Saad & Lindsay, 2010).

The existence of Special Needs students was another challenge encountered by teachers when delivering learning materials. Besides accepting normal students, Inclusion Elementary School also accepts Special Needs children (Chaimaha et al., 2017; De Picker, 2020), which commonly possess various limitations, such as blindness, deafness, weak IQ, hyperactivity, etc. Since each type of Special Needs has different teaching approaches, teachers need various great learning methods, models, and media when lecturing the affected students. This poses a huge challenge in Inclusion Elementary Schools, where increased concentration is the most maximal method employed (Dobson & Dobson, 2021).

Teachers often experience difficulty in transferring knowledge to Special Needs students in Inclusion Elementary Schools, especially those in the ADHD category. This causes distraction of students' concentration during the delivery of learning materials. Based on previous preliminary studies, several problems were encountered by teachers in increasing students' concentration in Inclusion Elementary School. These problems include the following, (1) the Inability of ADHD students to be conditioned when using the lecture method during the learning process, (2) Normal students are often affected by disabled people during learning, and (3) Inadequate special multimedia-based learning media by the teachers in teaching ADHD students. From these contexts, teachers need adequate special media during the learning process in Inclusion Elementary School, for the optimal concentration of disabled children.

Various previous reports also recommended the implementation of gamification in the learning process to improve the concentration of ADHD students. This recommendation emphasized the increase of learning concentration in both ADHD and normal students. According to Rivera and Garden (2021), gamification, as

a learning medium in school, educationally helped the development of cognitive aspects and assisted students in adequately adopting the conveyed learning materials. Learning media also helped increase students' active roles in classroom participation. For example, students are commonly eager to compete and work with others when directly performing quizzes on gamification media.

Laubersheimer and coauthors (2016) also stated that gamification implementation helped students understand learning material during mathematics education. This was because some story problems emphasized mathematical calculations for students at school. From this context, the implementation of the game media led to higher learning outcomes. This showed the appropriateness of gamification for students learning, especially in mathematics education. Other previous reports also proved that gamification positively affected students in the classroom learning process (Cruaud, 2018; Nurtanto et al., 2021; Yang et al., 2021).

Based on these descriptions, gamification positively benefitted and impacted the development of students due to being a game-based media helping the learning process. From this context, the use of the media has several benefits and uniqueness obtainable by students. Firstly, the ability to compare the appropriate number of questions answered in real-time when working on quizzes (Yang et al., 2021). Secondly, the competition between classes becomes clearer. For example, during a quiz, the scores obtained by students are directly assessed, leading to the observation of the highest and lowest-ranked individuals. This performance encourages students to compete optimally in answering questions (Prott & Ebner, 2020). Thirdly, teachers monitor academic checkpoints and levels, as well as the progress accumulated during the learning processes. In this case, students obtain maximum outputs due to direct monitoring by the teacher (Buckley & Doyle, 2016). This three uniqueness are considered the very positive benefits used by teachers to teach and increase learning concentration in Inclusion Elementary School.

By using gamification, the benefits obtained are highly emphasized in Inclusion Elementary Schools, especially for ADHD students. Regarding concentration, some differences are also found in the focus of ADHD and normal students. Firstly, the characteristics and activeness in the classroom where ADHD students are hyperactive, restless, and easily bored when listening to the teacher's explanation (Anastopoulos et al., 2018; Greene, 1995). This is different from the state of other normal children in the classroom, which are maximally conditioned and

focused on learning materials conveyed by the teacher for a longer time. Secondly, the difficulty in concentration, where ADHD students often daydream during the teacher's explanation in the classroom (Prevatt et al., 2017; Sibley, 2021). In this case, normal students have no difficulty and concentration in every learning process. From these differences in characteristics, classroom learning requires special media for students to optimally achieve academic goals.

According to the benefits and uniqueness, the learning process appropriately needs gamification media in Inclusion Elementary School with ADHD students, to increase academic concentration. Besides from the previous reports on the positive impact of gamification on Elementary School students, its analysis of the improvement of ADHD children's learning concentration is yet to be examined. Therefore, this study aims to determine the use of gamification in increasing the learning concentration of ADHD students in Inclusion Elementary School. This analysis is very important due to positively affects students and other teachers when using the proposed media in the learning process. Based on the background and objectives of the study, the following study questions are observed, (1) What are the methods used by parents in upbringing ADHD children at home? (2) What are the policy imposed by school principals in helping these disabled children increase their concentration? (3) What are the steps used in implementing gamification for learning concentration improvement of ADHD students in Inclusion Elementary School?

LITERATURE REVIEW

Special Education Policy and Practices in Indonesia

Special Needs education is a top priority in the implementation of government policies (Casmana et al., 2022; Dryer et al., 2016). This is due to be a school program specifically established by the government for disabled children (ABK). As a country with a population of around 250 million people, Indonesia also has several citizens with various kinds of special needs, such as those included in the ADHD category (Berchiatti et al., 2021; Papadopoulos et al., 2002). According to the National Education System Law Number 20 of 2003, the type of learning process for disabled children was Special Education, where academic procedures are conducted at SLB (Special School). Article 23 (1) of Law No. 20 of 2003 also stated that Special Education was used by students having the potential for intelligence and special talents or those experiencing difficulties in understanding learn-

ing processes due to physical, emotional, mental, and social abnormalities. To organize Special Education and serve disabled students, learning processes should be performed inclusively or in the form of Special Education units at primary and secondary levels. In Indonesia, Special Education policies emphasizing applicable laws and regulations only exist at primary and secondary levels, while none is observed for universities (Climie & Mitchell, 2017; Saad & Lindsay, 2010; Sibley, 2021).

Besides the national education system law, Government Regulation Number 17 of 2010 concerning the Management and Implementation of Education is also observed. Based on Article 129 paragraph 3, several types or categories of children were found with Special Needs in Indonesia, including (a) blind, (b) deaf, (c) speech impairment, (d) mentally impaired, (e) disability, (f) hearing impaired, (g) learning difficulties, (h) slow learners, (i) autistic, (j) motor impairments, (k) narcotics, illegal drugs, and other addictive substance victims, and (l) other abnormalities (Hakam, 2018; Prabawa-Sear, 2018; Prasetyo et al., 2020). This indicated that the categories or types of Special Education varied greatly in the country. Therefore, primary and secondary education units are needed to prepare qualified educators for the provision of maximum education to Special Needs students. Article 130 paragraph 1 of Government Regulation Number 17 of 2010 also declared that Special Education for disabled students was held in all pathways and types of education at primary and secondary levels. In addition, the implementation of Special Education is commonly carried out through exceptional, general, vocational, and/or religious units. This explains that the general education school accepting disabled students are inclusive institutions (Rachmawati et al., 2022; Saad & Lindsay, 2010).

Based on Special Education units in Indonesia, SLBs are highly observed in different types. These institutions include Sekolah Luar Luar (SLB) A, B, and C, which are devoted to blind, deaf, and intellectually-disabled students, respectively. Sekolah Luar Luar (SLB) D, E, and F are also observed for students with minor, moderate, and double disabilities, respectively (Prasetyo et al., 2020; Rachmawati et al., 2022). Despite the aforementioned laws and government regulations, the Minister of National Education (Permendiknas) Number 70 of 2009 concerning Inclusive Education for Students still considered the children having potential intelligence and/or special talents. This showed that the central government required the district/city authorities to appoint at least one elementary or junior high school in each sub-district while encouraging the secondary unit to provide inclu-

sive education. From this context, the institutions providing inclusive education should accept students with special needs (Casmata et al., 2022; Girli et al., 2016). According to several regulations and laws in Indonesia, students with disabilities or Special Needs were highly considered by the government, where the options to attend both exceptional and inclusion schools were adequately provided. The government also provided several categories of SLB regarding their disability categories, as stipulated by law.

What Services are provided to students with ADHD in Indonesia?

Special Needs children are found to experience disorders and need exceptional services for appropriate learning process achievements (Fitzgerald et al., 2020; Nolan & Gleeson, 2017; Williams et al., 2018). They are found to have physical, mental, intellectual, and emotional disorders, which require the needs for special services. Based on the Minister of Women's Empowerment and Child Protection Number 4 of 2017 concerning Special Protection for Disabled Children, kids with disabilities need exceptional safety through humane treatment. This emphasized the dignity and rights of children, fulfillment of special needs, equal treatment with others to achieve full social integration and individual development, as well as public assistance (Husen et al., 2022; Prasetyo et al., 2020; Zid & Casmata, 2021).

ADHD or Attention Deficit Hyperactivity Disorder is a type of disability for several students, which is behaviorally characterized by impaired concentration, out-of-control speech, and hyperactive attitudes (Berchiatti et al., 2021; Ewe, 2019; Honkasilta & Vehkakoski, 2019). According to some previous reports, ADHD was a persistent pattern of concentration difficulty or hyperactive and impulsive behavior frequently and severely observed than normal in various individuals. The main symptom of this disorder also emphasizes the inability to concentrate for a long time, leading to easy distraction and noisy attitudes. This situation subsequently causes difficult learning, behavior, and socialization, indicating that ADHD students institutionally need special services.

Inclusion Elementary Schools are responsible for several special services in Indonesia, which emphasize self-control and learning needs, to meet the requirements of ADHD students (Prasetyo et al., 2020; Rachmawati et al., 2022). These services initially involved the design of a distinctive curriculum, which is tailored to the characteristics of ADHD students and the existence of special assistant teachers in the classroom. From this

context, special assistants helped the main teacher in delivering learning materials in the classroom. In Inclusion Elementary School, the implemented special curriculum was also adjusted to the needs of ADHD students. An example prioritized the reduction of the minimum completeness criteria (KKM) and some sub-materials, as well as the adjustments to the portion of students. Although ADHD students have concentration difficulties, the implemented institutional curriculum was still adjusted by reducing the standard of assessment and learning outcomes (Greene, 1995; Prevatt et al., 2017). The provision of Special Assistance Teachers (GPK) is also an exceptional service for ADHD students. This assistant is expected to guide, supervise, accompany, and transfer knowledge to them. In this context, 1 GPK is only intended for 1 disabled student, toward providing maximum service. In addition, the provision of these assistants is to carry out their functions in developing the potential of ADHD students.

Gamification Learning Media

Gamification is presently a digital buzzword in the educational system, with Yusuf defining it as a learning approach implementing game elements to motivate students, maximize a sense of pleasure and involvement, as well as encourage continuous studying in the academic process (Prevatt et al., 2017). This opinion emphasized the aims of learning media in transforming non-game activities into educational activities, by combining the rules of the game, namely patterns, design, and mechanics (Ewe, 2019). According to Kiryakova, gamification was interestingly the development of appropriate learning in various educational activities. From these previous perspectives, learning media prioritizes the implementation of game designs, which are attractively developed through an educational approach emphasizing students' academic motivation (Saad & Lindsay, 2010).

Based on the application of gamification in the learning process, some previous reports argued that the educational process focused on having fun, improving students' understanding (Alfaqiri et al., 2022), motivating academic performance, and strengthening behavior. Learning media also combines cognitive and psychomotor skills in students (Prott & Ebner, 2020). By implementing the learning process in the classroom, the teachers also impart new knowledge to students. Moreover, the performance of learning activities in the classroom is not easy, due to solely relying on lecture methods to deliver material in heterogeneous classrooms. The

following criteria are observed for the implementation of gamification, 1) The overall value of the game, 2) Adequate work performance with gaming precision, 3) The suitability of the material to the child's abilities, 4) Relevant, 5) Objectivity, and 6) Feedback. From these contexts, the entire set of the aforementioned theoretical frameworks is explained as follows, past literature lacks a nuanced understanding of how gamification elements can affect solvers' crowdsourcing behaviour via intrinsic and extrinsic motivations. We conceptualised two typical gamification elements (points and immediate performance feedback (Yang et al., 2021):

Students with Special Needs Concentration

The learning concentration of ADHD and general students are very different, with the main problem for disabled individuals being the lack of focus on the delivered academic materials. From this context, ADHD students need special services to carry out learning concentration (Winata, 2021). The mind of children diagnosed with ADHD should also not wander around causing concentration problems. This indicates that the mind needs to be on one point of work, leading to the daily development of stronger mindsets.

A student's concentration is also commonly activated by developing a relaxed state and a pleasant atmosphere. This explains that tense ADHD sufferers are unable to use their brains to their full potential due to having blank minds (Sibley, 2021). When a child with ADHD can concentrate, the learning process undergone also becomes successful, accompanied by the will to achieve the ultimate academic goal. In addition, teachers need to provide specific actions for these students, by applying specific strategies and methods in the classroom learning process (Climie & Henley, 2018).

The implementation of gamification media is a learning strategy helping ADHD students to achieve academic objectives. This strategy is used to encourage enjoyable teaching and learning processes, toward increasing the understanding of educational materials for disabled children. Based on Prevatt (2017), the application of gamification encouraged a very enjoyable classroom learning process for students, toward more concentration and assignment completion. In this case, students were expected to understand and connect with the materials conveyed by the teachers (Sibley, 2021). When an ADHD sufferer is motivated by self-study, enthusiasm is often exhibited toward learning and improving academic performance (Prasetyo et al., 2020; Rachmawati et al., 2022).

METHOD

Study Design

A descriptive-qualitative approach was implemented to describe several elements of the acquisition of written outputs (Cohen et al., 2002). From this context, the methods implemented by the Inclusion Elementary School teachers in using gamification were comprehensively described, especially the patterns of gradually increasing students learning concentration. Furthermore, three main reasons were observed for the selection of a descriptive-qualitative approach. Firstly, teaching Special Needs students is very difficult because of the different levels of disabilities, especially ADHD. In this case, the Inclusion Elementary School used as an experimental location has very experienced teachers, leading to the use of gamification media for disabled children. This led to the use of observation and interviews to determine the teaching methods implemented by teachers. Secondly, the Elementary School having Special Needs students, especially in the ADHD category is very rare. When this type of institution is found, the description of the teaching patterns should be the most appropriate experimental method. Thirdly, this descriptive method is very adequate due to directly observing the preparation processes carried out by teachers in educating the character of every student.

Participants

This study was conducted at an Inclusion Elementary School in Subang City, West Java Province, Indonesia, due to two main reasons. Firstly, the Inclusion Elementary School having Special Needs students, especially in the ADHD category, are very rare. Based on the data obtained from the Subang District education office, only one appropriate institution was observed, leading to its selection for the experimental processes. Secondly, the teachers in the Elementary School specifically have the experience and knowledge sufficiently competent in handling and educating ADHD students. Therefore, the

teacher becomes a key informant in the performance of this analysis.

A total of 13 participants, including 4 Inclusion Elementary School teachers, 4 ADHD students, 4 parents, and 1 principal, were voluntarily involved in this study. Table 1 presents the categories of the study participants for appropriate understanding.

Based on Table 1, four main categories were observed for the study participants. Firstly, the teacher was interviewed to obtain the main information about the methods of implementing gamification in the learning process. This was because the game media helped students to understand the patterns of increasing adequate concentration. Secondly, Special Needs students were interviewed to determine more about the teachers' teaching methods and implementation patterns of gamification in the learning process. Thirdly, the parents supervising and caring for ADHD students were interviewed to determine the changes in the concentration level possessed by their children. Fourthly, the principal was selected to observe the policies developed by the school in teaching Special Needs children.

Data collection technique

The implemented data collection techniques were in-depth interviews, Focus Group Discussions (FGD), and observations. The in-depth interviews were conducted with one principal and four teachers having ADHD students in their classes. Since the teachers had a minimum teaching experience of five years, they subsequently possessed special attributes in handling disabled children. For FGD, the parents of ADHD students were also considered, to determine parenting patterns in increasing learning concentration. Meanwhile, the observation of students in the classroom was conducted to determine and describe the teaching methods of teachers in applying gamification media. From this context, a total of 13 participants, including 4 Elementary School teachers, 4 ADHD students, 4 parents, and one principal, were voluntarily involved in the experimental processes. Table 2

Table 1. **Category of Participants**

No	Category	Number
1	School Teacher	4
2	Special Needs Student	4
3	Special Needs Parent	4
4	School Principal	1
TOTAL		13

Table 2. The Data Collection Technique Information

No	Technique	Participants	Data Obtained
1	Interview	1. School teacher	The teacher's strategy in handling special students The learning media used by a teacher to educate ADHD students The benefit of using gamification as a learning media The gradual step of using gamification to teach ADHD students The teacher's strategy for improving students' concentration
		2. Special Needs parents	The parents' strategy in educating ADHD students The strategy for improving the concentration of students
		3. School principals	The school policy in improving teacher quality for educating disability students The strategy for teaching ADHD students
2	Observation	Classroom	Observing the teachers' application methods of gamification in improving the concentration of students Observing ADHD students' concentration in the classroom
3	FGD	Special Needs Students Special Needs parents	The concentration level of ADHD students The learning ability of students The efforts of students in improving concentration The parents' upbringing with ADHD students

shows more comprehensive details about the information obtained from the data collection stage.

Based on table 2, the information matrix obtained from interviews, observations, and FGD was emphasized. This indicated that the gamification media data were maximized in increasing students' learning concentration.

Data Analysis Technique

Context analysis techniques were also used in this study, through the Cresswell method. From this context, the following steps were observed, 1) the data obtained from the interviews and observations were changed to a text-narrative form for easier analysis, and 2) data reduction was used to eliminate some irrelevant information. This confirmed the use of only the relevant information related to the implementation of gamification for ADHD students, and 3) data display, which showed the information processed and finalized into analytical outputs (Creswell, 2014).

Based on the data analysis, the development of the transcript information obtained from observations and interviews was initially conducted. In the interview, the following steps were used, (1) reviewing the recordings of several people to ensure true and appropriate data, (2) determining several steps or methods used by teachers to improve the learning concentration of ADHD students, and (3) analyzing some strategies used by parents in educating Special Needs children. Meanwhile, the following steps were conducted for the observation, (1) generating

several codes from the observation notes prioritizing the study question, and (2) searching for various codes to determine the data emphasizing the use of gamification in the learning process. Based on the results, the data presentation prioritizing the improvement of learning concentration for ADHD students was performed.

RESULTS

Based on the results, the use of gamification increased the concentration of students' learning outcomes, especially for those in the ADHD category. This indicated that disabled students had very poor concentration levels and were far from the average academic performance. From this context, special strategies and mentoring from the class teachers are highly needed for adequate development. For gamification users, ADHD students also had the desire to perform group learning participation, for the involvement of their friends in each academic process. This confirmed that gamification provided understanding and uniqueness for both regular and Special Needs students. Inclusion Elementary School students also understood every educational process through the game media, including learning materials, videos, resources, and evaluations. In addition, the teachers were able to direct the use of gamification toward teaching about learning concentration. This explained the teaching methods applied during the use of gamification in every learning process, to strengthen educational personnel in classroom academic performance.

Study Question (RQ1): What are the methods used by parents in upbringing ADHD children at home?

The parents of ADHD students played very important roles in the educational process at school and home. This indicated that they provided full support to their disabled children, toward being continuously enthusiastic about learning and working. In this study, the parents were willing to be interviewed about the methods of raising ADHD students at home while improving their learning concentration. From the results, many events were not provided in supporting and educating students toward full concentration.

Based on the interview, the provision of more attention to the children was the initial method carried out by the parents. This is very necessary for ADHD students, regarding the acquisition of special therapy at home. It also encourages students to be happier when close to their parents. This was supported by the following FGD sessions,

"After finishing learning at school, I always follow up with my child and invite him to talk about what material has been learned at school" FGD, parents 2

"I always give more attention to my child by accompanying him in various things at home, especially in his academic activities, so that my child is slowly able to concentrate" FGD, parents 4

The provision of more attention to ADHD students played a very important role in increasing general concentration, especially in the learning process. Based on FGD, most parents provided more attention to their children in various patterns, including the performance of deep talk with them. This talk session is an invitation for ADHD children to communicate with parents after completing learning at school, regarding the recall of the conveyed academic materials. Based on several deep talks conducted by parents, disabled children were happy and possessed many stories when their teachers used gamification media as a teaching method.

This attention provision was accompanied by providing special assistance when ADHD children are at home, through working on classroom assignments. Since teachers often provided assignments after school, ADHD children were observed to immediately contact their parents for assistance. When provided with special assistance, they felt very happy due to the help rendered by their parents. These mentoring activities helped students improve adequate learning concentration.

"I try to add some special activities after class at school such as teaching students to swim lessons or some other sports activities" FGD, parents 4

"My children are very happy when teachers use Gamification in their school, so they are able to tell stories well at home" FGD, parents 1

Based on FGD, some parents provided some additional activities to ADHD students after school events. From the response of various teachers, sports activities were also a method of developing their happiness toward increasing learning concentration. These activities, such as swimming, were subsequently used besides from learning, to increase the happiness of disabled children.

The use of gamification and learning methods by teachers also affected students' academic concentration. This was in line with the FGD information obtained from several parents, where the classroom usage of the game media led to the happiness and easy acceptance of learning materials by ADHD students. From this context, the use of gamification increased the learning concentration of students in Inclusion Elementary School. Therefore, the game media needs to be improved and developed by teachers in teaching disabled children.

Study Question (RQ2): What are the policies imposed by school principals in helping ADHD students increase their concentration?

The education of ADHD students is not a foolproof issue in Inclusion Elementary Schools. This is because students have special characteristics and problems related to learning concentration, regarding the difficulty compliance with the school materials. From this context, inclusion institutions need various special strategies for educating disabled children. Based on the results, three specific policies were observed for the school responsible for educating ADHD students, namely (1) improving communication between teachers and parents, (2) directing ADHD students to participate in extracurricular sports activities, and (3) supporting teachers in using gamification learning media for teaching processes.

From the interviews with the principal, the first policy emphasized strengthening the relationship between the school and parents. This indicated that the close relationship between both parties provided more attention and positively affected ADHD students. In this case, students often feel more cared for by the teachers and parents at school and home, respectively.

"School always holds regular meetings with parents, especially students with ADHD special needs. The meeting is held every three months to cooperate in educating students"
Interview, school principal

Based on the results, a school needs to collaborate with parents to strengthen relationships and educate disabled children. From the principal's information, the meetings conducted by teachers and students were also held every three months, to obtain and evaluate learning concentration progress. During this period, both parties commonly discussed and communicated directly about the classroom learning progress, to obtain maximum outputs in the acquisition of reciprocity. Regarding the discussions of the teachers and parents, the personalities and abilities of students, based on the concentration, were highly considered.

In the principal's second policy, the provision of special instructions for ADHD students to participate in extracurricular sports activities was considered, to improve learning concentration. These activities had a positive impact, especially during teaching and learning events. In this Inclusion Elementary School, the extracurricular activities mandatory for the participation of students were basketball and futsal.

"I made a special rule where students with Special Needs including ADHD, are expected to participate in extracurricular sports. In addition to increasing fitness, this activity is able to increase students learning concentration"
Interview, school principal

Based on the perspectives of the headmaster, extracurricular sports activities helped to improve the learning concentration of students including those with Special Needs and ADHD. These activities subsequently had several benefits, such as body health maintenance and provision of freshness to the brain, toward the improvement of better learning concentration. Therefore, the learning concentration of ADHD students should be trained to comply with maximum educational activities. To support these events, the sports activities need to be in line with the learning process.

The third policy provided by the principal emphasized the encouragement of class teachers during the implementation of gamification with ADHD students. In this case, the game media implementation positively impacted the teaching and learning processes of disabled

children. This showed that the use of gamification media encouraged the happiness and enthusiasm of ADHD students during learning. Therefore, the principal advised teachers to use game media in every academic process in the classroom.

"I really understand that the implementation of gamification is very difficult, but this is very good for ADHD students. This is because gamification can make ADHD students concentrate longer than if they don't use learning media"
Interview, school teacher

From the results, the use of learning media during the teaching and learning process in class was mandatory. This indicated that the principal required teachers to use gamification in teaching within Inclusion Elementary School, due to its ability to improve learning concentration for ADHD students. Based on the principal's experience in teaching, the game media also had several features and benefits, which were used for the learning process in the classroom. Firstly, gamification had animations capable of provoking students to learn. These animations were developed as cartoons for the happiness of disabled children, toward appropriate learning and understanding. For example, students were very happy to assimilate and understand the conveyed teaching materials during mathematics education. This was because the animations or cartoons provided re-explanations, subsequently allowing students to repeat them at home with help from parents. In this case, the use of gamification provided maximum impact in every learning process.

Study Question (RQ3): What are the steps to use gamification in improving the learning concentration of ADHD students in Inclusion Elementary School?

The use of gamification in the classroom learning process was highly important in determining the methods of increasing academic concentration. Based on the observations and interviews with teachers and ADHD students, several steps were used during the implementation of the game media. Table 3 shows the steps performed by teachers when applying gamification.

Based on Table 3, some of the steps considered by teachers in using gamification were observed. This indicated that the game media was divided into three main parts, namely the opening, core, and closing categories. In the opening stage, several conversations were carried out by the principal, teachers, and students for appropriate greetings. This activity was performed to attract the

Table 3. Steps to using gamification in the learning process

No	.PART	STORYLINE	VISUAL	NARRATION
1	Opening	The opening game The atmosphere of school activities/events on Mondays Describing inclusion school. Students are observed with sticks, and wheelchairs, hyperactive children running around/disturbing their friends A flag ceremony is observed with students wearing white shirts	The school setting/field The bell rang and pupils lined up for the ceremony The opening from the principal	In the opening, an animation is observed as remarks from the principal, regarding the material to be delivered and learned by the teacher and students, respectively. This is carried out for students to determine the types of activities and materials to be used and learned during the implementation of gamification media.
Select Level				
2	Level 1	Story questions with storylines where students are performing in-class learning	Avatar walks toward the classroom Sitting in the classroom The teacher provides a question Providing gifts in the form of Uniform Clothes	In this section, several story questions are provided by the avatar. This attracts students' attention when listening to the questions provided by the teacher.
3	Level 2	A matter of stories with a medium flow of learning sports Schoolgirls wearing sports-wear		The animation used is Elementary School students wearing special sports clothes before explaining the material
4	Level 3	The story with the flow of snacks in the canteen Students wearing batik clothes and red sd pants	Canteen door entrance background Moving to the food stand Providing gifts in the form of uniform clothes	A story about Elementary School students wearing batik clothes in the cafeteria is observed, to attract classroom concentration.
5	Level 4	A matter of the story with the plot of studying in the school garden Scout outfit	Setting in the field Division of flags	In this section, the animation shown is a group of students gathering and playing together in the school garden, to provide learning motivation for students.
6	Level 5	The story of carrying out solar <i>duha</i> Muslim uniform clothing	15 <i>peci</i> in the closet, shared with 10 friends	This section provides motivation about praying together in the morning, so this video can inspire students to start with worship
7	Evaluate by performing 5 short story questions			This section is an evaluation, so students do five math story problems.
8	Cover/ Closing	Homecoming activities Shows the patterns by which children concentrate when asked questions by the teacher.		This section contains the closing and provides a purpose to evaluate the comments given by students.

attention of students in the classroom, as well as eradicate boredom and panic before being provided with questions. Students also focused on the screen and the videos played by the characters in each episode, to encourage optimal preparation and concentration. The following sub-themes emphasize the explanation of the stages employed in using gamification.

Define learning objectives and big ideas for the game

Learning objectives are the most important components in the classroom, regarding the potential to outline educational outcome targets and the extent to which academic procedures are employed. Besides this, the main idea of the game should also be described. In Elementary School, the purpose of learning emphasizes technological

knowledge provision and the encouragement of students in understanding every academic content delivered.

“Learning objectives are the most important components. So teachers need to determine learning objectives using this gamification”
Interview, teacher 2

“The big idea of the game has a very important role to play. So that students do not feel bored during learning process, a teacher needs to be able to potentially determine the main idea. This help students in learning process,”
Interview, teacher 3

Based on the interviews with teachers, learning objectives were the most important components in the educational sector. This indicated that teachers need to determine learning goals and big game ideas, to achieve success during gamification implementation. When Pancasila and Citizenship Education is taught in the classroom with cultural diversity mainly emphasized, the expected learning design and objectives need to be correlated. Since the purpose of learning Pancasila is observed, the anticipated gamification design should be relevant and related to the topic conveyed.

From the results, the teacher needs to determine the big or the main idea of using the game media after understanding the learning objectives. Based on the observations, online games were used in teaching mathematics through various on-screen presentations. Moreover, gamification is a learning approach where teachers use game elements to improve students' motivation and enthusiasm in the academic process. When the subjects to be taught are related to the social science courses, the implemented game also needs to emphasize the subjects. In this case, the main objectives and ideas of the game media were determined based on the learning objectives and subjects presented by the teacher in the classroom.

“In the learning process, the teacher divides into five levels, which are the core material in each learning process. The five levels aim to be able to adjust according to the abilities of students in Elementary School so that they can follow the learning process to the fullest”
Interview teacher 4

In Table 2, the levels in each lesson were observed and used to measure the ability of students to learn the conveyed subjects. The ability levels were also used to determine to learn translated into story questions, which were employed by students to develop and obtain maximum outputs.

Create groups, and scenarios and design learning activities

The second step emphasized the determination of the group after acquiring the main idea in the learning process. This indicated that the implementation of Gamification needs to be jointly performed due to its stimulation and encouragement of students' creativity in the learning process. In determining the group, the criteria proved that Special Needs students should be mixed with other normal learners. For example, when a group consists of five people, one disabled student needs to be mixed with four normal individuals.

“Groups have a very important role in the learning process, this is because the group is able to make ADHD students participate in the learning process”
Interview, teacher 1

“My children are always happy when learning in groups because they tell me that their friends are very good and can learn more optimally”
FGD, participants 1, 2, 3

The results showed that group participation enabled academic performance comfort during the learning process. Based on FGD, ADHD students always expressed to their parents about participating in the learning process through the instructions delivered by the teacher and group friends. After the group performance, the teacher integrated the values obtained into the learning process. When the learning purpose in Pancasila and cultural diversity had been determined, the implemented teaching media also needs to be related to the subject and topic. This proved that students gradually developed learning concentration through the use of gamification. Although ADHD groups had limitations in learning concentration, they still had fun through group education and game implementation. This led to a higher level of interest and happiness, which caused more academic concentration.

A website-based application, namely Wordwall, was also used to teach about Diversity and Pancasila. Based on the classroom observations, students were very happy with the implementation of the application, especially the “open the box” feature, where they guessed the hidden contents.

“The use of wordwall applications, especially “open the box”, makes students become enthusiastic in answering questions, so that discussions become more active and interesting”
Interview, teacher 3

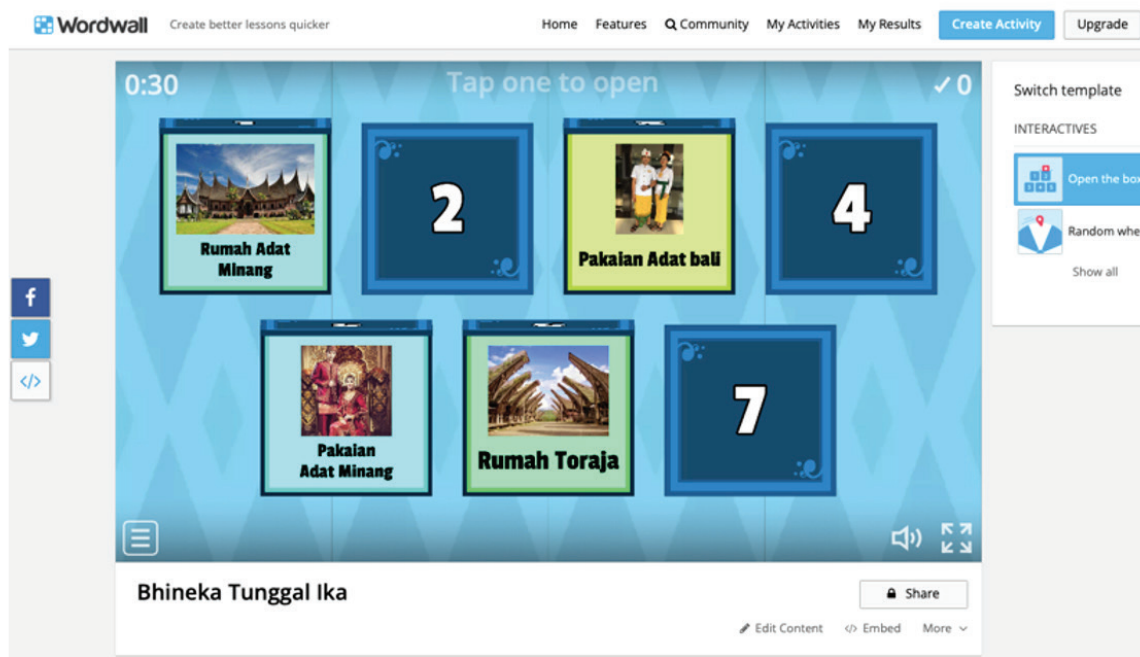


Fig. 1. Wordwall application opens the box as a form of gamification

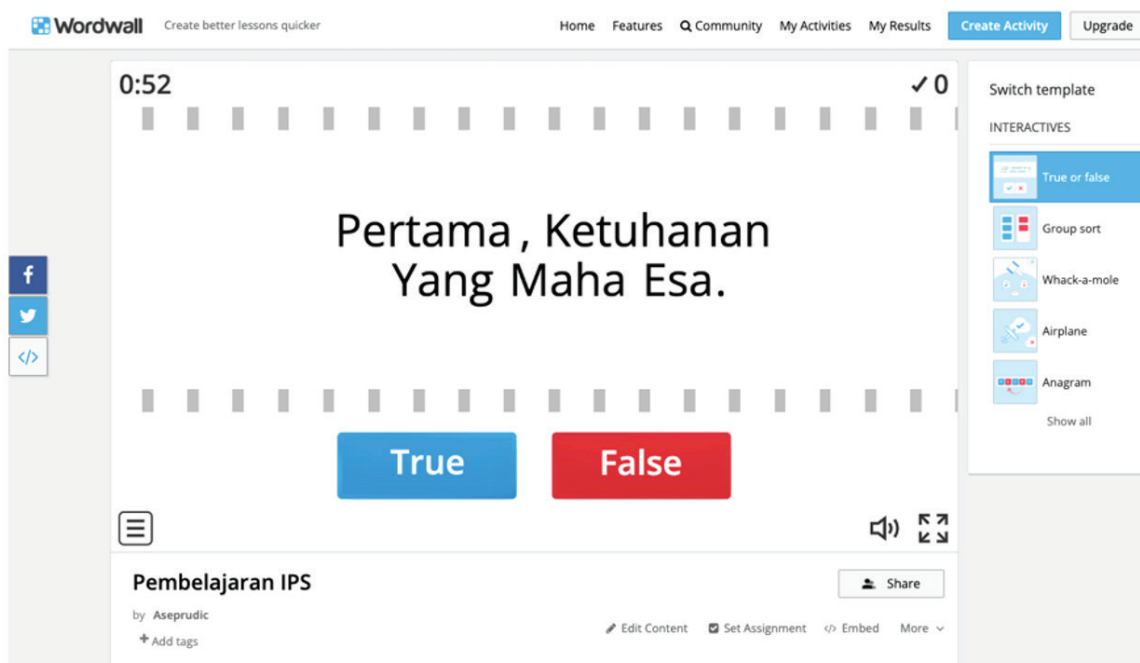


Fig. 2. Questions on wordwall

According to Figure 1, one example and form of using open the box was observed, regarding the implementation of wordwall in learning gamification for ADHD students in Inclusion Elementary School. From the teacher's description at the interview, the use of the website-based application encouraged students to be more participating in the learning process, leading to high-level happiness and interactivity.

In learning Pancasila and Citizenship Education, especially "Bhineka Tunggal Ika", students also attempted to understand the diversity of regional cultures, ranging from traditional houses, clothes, and several landmarks from every Indonesian city. Since the implementation of the wordwall application is supported by this knowledge, the learning process became more interactive and interesting.

“ADHD students that usually have difficulty concentrating and participating in the classroom also actively participate in the learning process, there is even one ADHD student who answers correctly in one box”

Interview, teacher 4

Based on the results, ADHD students were very happy with one of the menus in Wordwall, namely “True or False”. In this case, the implemented learning objectives encouraged students’ knowledge and understanding of Pancasila as a form of activity and practice in daily life. This led to the correlation of the game media to the subject and topic conveyed by the teacher. From the observations, the groups with ADHD students appointed them to answer most of the questions provided. When the answer is correct, all other groups provided their appreciation, leading to happiness and pleasure for disabled children, as well as motivation toward becoming more eager to learn about Pancasila.

DISCUSSIONS

Gamification is an approach used to increase students’ concentration in the learning process (Buckley & Doyle, 2016). This is mostly used in Inclusion Elementary School, where teachers often encountered difficulties in teaching and providing learning materials to students, especially in increasing academic enthusiasm. When ADHD students are included in the learning process, concentration often becomes one of the most important problems, leading to the need for special media and applications in every academic procedure.

Gamification also has several positive benefits and impacts in improving students learning concentration, including that of disabled children in elementary school (Rivera & Garden, 2021). According to Rivera and Garden (2021), several benefits were related to the game media implementation in every learning process. These benefits included 1) enabling learning to be more fun and interactive, 2) developing a desire to comprehensively determine the information about the material presented by the teacher, 3) providing students with the opportunity to observe and use the application in the real world, 4) obtaining feedback from students at a moment’s notice, and 5) improving students learning concentration (Cruaud, 2018; Laubersheimer et al., 2016).

In the field analysis, the use of gamification also increased the learning concentration of students in Inclusion Elementary School. This was in line with Rivera and Garden (2021), where similar outputs were observed.

The visible form of concentration was also the enthusiasm of students in delivering the material and responding to the use of the wordwall application. Therefore, the implementation of gamification, especially with the help of wordwall, was very effective in increasing learning concentration in ADHD students.

CONCLUSION

Based on the results, gamification implementation helped ADHD students in increasing their learning concentration. Despite having difficult characteristics in the learning process, these students were still always active in the classroom. In this case, teachers need special methods and media to stimulate their participation in academic procedures. Furthermore, the use of gamification increased learning concentration, encourage students to become actively involved, as well as stimulate group discussions and happiness in answering learning materials. From this context, the application used by teachers in implementing the game media was Wordwall, due to learning objectives emphasizing Pancasila and Citizenship Education, as well as cultural diversity knowledge. This condition emphasized the stimulation of students to become more interested and concentrated in the classroom academic procedures.

Although the learning concentration of ADHD students was very difficult to develop and improve, several efforts still yielded positive outputs. Based on the results, the implementation of gamification was unique in the concentration of students, due to three main factors. Firstly, the role of parents in helping to improve the academic focus of ADHD students. This indicated that the parents played very important roles, especially in the provision of special attention and invitation to sports activities. These indicators were highly effective in improving the concentration of students. Secondly, school policy played a very important role, with positive impacts observed according to the rules and regulations of the inclusion school’s principal. These regulations included the improvement of the relationship between parents and class teachers, for adequate communication about students’ learning outcomes. Thirdly, the principal suggested that teachers should be to implement gamification during teaching, due to its ability to increase learning concentration.

From the results, two steps were also observed in using gamification as a learning medium for Inclusion Elementary School students, namely 1) determining learning objectives and big ideas of the game, and 2) es-

establishing a study group, scenario, and design of learning activity. This proved that ADHD students were equated with being combined with other individuals during group learning, for the stimulation of more interest and happiness in each of their academic activities. Despite positively impacting the Inclusion Elementary School students, the implementation of gamification still had various drawbacks. This included the application's offline multimedia, which caused the difficult update of the materials and questions delivered. In this case, teachers need to develop new materials when curriculum changes are observed. However, the implementation of gamification

succeeded in increasing the learning concentration of ADHD students, leading to the stimulation of happiness and assistance in every educational process.

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