JCAR 7(1) (2025)

Journal of Classroom Action Research

http://jppipa.unram.ac.id/index.php/jcar/index

Index Card Match With QR Code Card To Improve Students' Learning Motivation

Yulia[1], Nani Astria[2], Wawan Krismanto[2*]

[1,2,3]Department of Elementary Teacher Education, Faculty of Education, Universitas Negeri Makassar, Indonesia.

DOI: https://doi.org/10.29303/jcar.v7i1.8675

Received: 29 Desember 2024 Revised: 23 Februari 2025 Accepted: 28 Februari 2025

Abstract: This study aims to determine the improvement of the learning process and student learning motivation through the index card match (ICM) learning model with QR code cards. The approach to this research is qualitative with the type of classroom action research. The action process is taken out in three cycles. The focus of the study is the learning process and student learning motivation at fifth-grade UPTD SD Negeri 57 Parepare. Data collection techniques were in the form of observation, questionnaires, and documentation. The research instruments were observation sheets, reflection sheets, and student learning motivation questionnaires. Data were analyzed through condensation, presentation, and drawing conclusions or verification. The study's results showed that various changes in the learning process occurred through ICM with QR code card games. Students' enthusiasm was seen during learning; they became more actively involved, showed good collaboration with their group friends, and showed self-confidence. In the first and second cycles, there was no significant increase in learning motivation, and in the third cycle, 75% of students were in the Good or Very Good category. The conclusion is that using the ICM learning model with QR Code Cards can improve learning and student motivation.

Keywords: Index Card Match, Learning Motivation, QR Code.

Introduction

One of the subjects in the Independent Curriculum is Natural and Social Sciences (called IPAS), which studies living and non-living things in the universe and their interactions. It also considers human life as individuals and social beings interacting with the environment (BSKAP Kemendikbudristek, 2022). Karima (2018) stated that one of the essential things in the Independent Curriculum to improve the Indonesian basic education system is to combine Natural Sciences and Social Sciencesinto Natural and Social Sciences (called IPAS).

It is essential to teach the IPAS subject in schools with the hope that students will be able to overcome problems in their environment, such as the family, community, and school environment (Hardiansyah et al., 2022). By studying IPAS, children develop research skills to find new ideas and concepts and develop perspectives for the future (BSKAP Kemendikbudristek, 2022). This is the opinion of Parni (2020) who stated that Social Sciences are used in schools to instill good values in students as members of society and help them become good citizens who can update their past experiences to the present.

However, conditions in schools are different from what is expected; science learning has not been able to make students become individuals who can adapt to the social environment in society and solve their problems. This is because science learning is a subject that is less aware of its importance in absorbing knowledge; in the learning process in class, students take it lightly and do not understand the values contained in science learning, causing learning to

Email: wawan.krismanto@unm.ac.id

become monotonous, this is none other than the result of students' motivation in class is very lacking. One of the factors that causes student motivation to be less than optimal is the teacher factor; teachers and students who still dominate learning are not allowed to develop independently in their thinking process, so learning in class is one-way. This is in line with the description of conventional social studies learning activities that often occur in elementary school classes, namely students only listen while taking notes; teachers become the center of learning, only oriented towards achieving learning outcomes, teachers are still the only source of knowledge; knowledge is transferred only once by the teacher through one-way information transfer (Hati, 2021; Karima, 2018; White, 1997).

Based on the problems that have been explained, the essential factor to be done is to change the strategy in classroom teaching and learning process activities. Teachers must be able to find solutions to the obstacles experienced in teaching activities; teachers are figures who play an essential role in learning activities in the classroom. This is in line with the opinion of Ni'mah & Syarifuddin (2023) who stated that teachers make a significant contribution to the success of learning in schools; teachers play a significant role in supporting student growth and development so that they can achieve their life goals optimally.

The use of a suitable learning model can have a significant impact on the student learning process; by using an exciting learning model, the learning process will be varied, students will give more meaning to the content of the learning and will not take all moral values lightly and make the learning process not monotonous. This is in line with what was stated by Albina *et al*., (2022) who stated that learning models or learning strategies are fundamental in the learning process to minimize monotonous learning. Monotonous learning can cause students to get bored quickly and reduce their interest in learning or motivation to learn.

Through direct observation by researchers during the learning process in the classroom and the results of interviews conducted with 5th grade teachers of UPTD SD Negeri 57 Parepare, researchers concluded that there was a problem of low student learning motivation in the classroom caused by two factors: namely teacher factors and student factors. From the teacher factor, it was found that teachers did not build cooperation between students, teachers used learning models that were less impressive for students, teachers taught by only relying on books and making learning run one way, and teachers did not provide feedback to students when the teacher had finished the learning process in the classroom. As for student factors, students considered the science subjects in class trivial, so they did not pay much attention to the material when learning took place; students felt monotonous with the learning methods used by teachers in the classroom, so students were less able to grasp the learning material well. Therefore, teachers need a learning model that can spur student motivation in the classroom and spur students' awareness of the importance of science subjects in schools. Based on the problems that have been explained, one of the suitable learning models that can be used to change classroom problems is the ICM learning model. ICM model is suitable for use in class and creates a pleasant learning atmosphere for students looking for matching card pairs(Endang Pudjiasuti Sartinah et al., 2019; Ni'mah & Syarifuddin, 2023; Yonanada, 2017). Furthermore, Hartiningrum & Ula (2019) explained that the ICM model uses many practice questions so that students do not feel bored and tired and do not realize that the learning process is taking place.

Along with the rapid development of technology, the ICM learning model still feels quite simple if it only uses paired cards printed on illustrated paper. Therefore, researchers are interested in using innovations like QR code cards. Through QR code cards, students will learn while using smartphones and match the results of scanning QR code cards with their classmates so that learning activities will have a different nuance and make the classroom atmosphere more lively. Picture cards combined with QR codes can increase teacher creativity and create a pleasant learning atmosphere (Ai Muflihah, 2021; Durak et al., 2016; Law & So, 2010; Mileva & Stoyanova, 2017; Shen et al., 2023; Sondhi & Kumar, 2022; Wayase, 2015). Based on the opinion above, the ICMing the learning model with QR code cards can increase student learning motivation in the classroom, and a fun and non-boring learning process will occur. Several research results on the ICM type were conducted byMuflihah (2021) who concluded that the ICM learning model can increase student motivation and learning outcomes. Further research was conducted byNazariah (2020) who concluded that the ICM learning model effectively increases student learning motivation. Furthermore, he concluded that the ICM learning model significantly influences student motivation and learning outcomes.

Based on the review of previous research literature, it can be concluded that there is a gap in the literature because the application of ICM is still limited to conventional use or has not utilized technological developments, such as integrating the use of smartphones and QR codes. This technology is very familiar to teachers and also elementary school children. This is a novelty for this researcher and will contribute to completing the limitations of the literature related to

technology integration in the implementation of ICM. The research innovation conducted by the researcher lies in the use of QR codes, which contain two-dimensional bars that can store data in the form of text, images, or videos. The use of QR codes in this study aims to increase the learning motivation of elementary school students by making learning more exciting and interactive. In addition, this research is essential because the ICM learning model with QR code cards has several advantages, such as effectiveness. This model has been proven effective in improving students' understanding of concepts. Secondly, interactivity is a learning model that makes learning more interactive and exciting for students, and technology in the learning process provides innovation in teaching methods.

For that, this research answer two research questions: 1) How does the index card application match the learning model with QR code cards to improve the learning process of 5th grade students at UPTD SD Negeri 57 Parepare? 2) Can applying the index card to match the learning model with QR code cards improve the learning motivation of 5th grade students at UPTD SD Negeri 57 Parepare? Based on the problem formulation, the research objectives are as follows: 1) To determine the application of the ICM learning model with QR code cards to improve the learning process of 5th grade students at UPTD SD Negeri 57 Parepare; 2) To determine whether applying the ICM the learning model with the QR code cards, which can improve the learning motivation of 5th grade students at UPTD SD Negeri 57 Parepare.

Method

The approach used in this study is qualitative.Fadli, (2021) stated that qualitative research understands human or social phenomena by creating a comprehensive and complex picture that can be expressed in words, providing detailed views from informants, and is carried out in a natural environment. The research design used in this study is the Classroom Action Research model developed byElliott (2001). Learning improvement is designed through several stages, namely: 1) planning, 2) implementation, 3) action observation, and 4) reflection. Implementation. Classroom action research (CAR) is a form of reflective research whose activities are carried out specifically to improve or enhance professional learning practices in the classroom (Nanda et al., 2021). In this study, the actions were to implement the ICM learning steps using QR code cards. The characteristics of the card are: 1) Rectangular, (2) Made of laminated HVS paper, (3) Has a size of 6 x 9 cm, (4) Contains a QR code that is connected to a short video and then there are answers and questions about learning materials.

The subjects in this study were teachers and students of 5th grade of UPTD SD Negeri 57 Parepare. The number of subjects in this study was 16 people, consisting of 5 female students, 10 male students, and 1 class teacher. According to the ongoing learning schedule, this research was conducted in May 2024 in 5th grade of UPTD SD Negeri 57 Parepare, South Sulawesi.

Data collection techniques in this study were observation, questionnaires, documentation, and reflection. The data collection instruments were observation sheets, learning motivation questionnaires, documentation, and reflection sheets. The questionnaire was developed based on motivation measurement indicators according toUno (2014)namely: (1) Having a passion and desire to succeed, (2) Having a drive and need to learn, (3) Having hopes and future ideals, (4) Having appreciation in learning, (5) Having engaging activities in learning, (6) Having a conducive learning situation. The qualitative data analysis process was carried out through three stages: data condensation, data presentation, conclusions, and verification. In the learning process to determine the level of success of teachers and students in each cycle, the determination of the success of this study is if > 70% of students are in the excellent category of learning motivation.

Result and Discussion

The planning stage is completed by compiling and developing a learning implementation plan that is consulted with the supervising lecturer and the homeroom teacher V as an observer during the learning process. The implementation stage is carried out by the researcher, who acts as a teacher, and the homeroom teacher, V, who acts as an observer. Cycle I was carried out on Tuesday, May 14, 2024 at 09.40-10.50 WITA. All 15 students of 5th grade attended the learning details of the implementation of the action consisting of three parts, namely preliminary activities, core activities, and closing activities. Learning begins with the teacher saying hello and asking how they are, followed by praying led by the class leader and checking student attendance. Then, the teacher informs the students of the learning objectives students of. Then, the teacher invites students to sing the national song to increase the love of the country in the students. The next activity is for the teacher to begin the core activity of adjusting the steps of the index card to match the learning model with the QR code card.

Figure 1. Example of QR Code Card Cycle I

Percentage of achievement of the learning process by implementing the ICM learning model with the QR Code Card aspect of the teacher in cycle I in the Good category. The percentage of achievement of the learning process aspect of students by implementing the ICM learning model with QR Code Cards has yet to reach the success indicator, so it obtains sufficient qualifications. However, during learning, there has been an achievement of learning motivation obtained when the teacher applies the learning model in 5th grade such as students are more enthusiastic about doing assignments, which can be seen from the enthusiasm of students looking for pairs of cards they have, students also seem interested in participating in learning in class using QR code cards, and students become more active in asking questions to the teacher when the learning process takes place. The results of categorizing the student learning motivation questionnaire show that out of 15 students, 11 or 74% have yet to reach the excellent category. Furthermore, the researcher reflected that the researcher found several shortcomings while implementing classroom actions. Namely, students could not form groups with their card partners because they were still choosing friends, the teacher could not convey the learning well, and some students needed help to grasp the learning material well. Some student pairs felt lazy about doing presentations in front of the class, and some students needed clarification about scanning cards, needed to listen to the teacher's explanation, and scanned their deskmate's cards and wrote them in their books. The. The teacher was less able to control students who wanted to be controlled and wandered around the classroom, so the researcher found several areas for improvement. The. The process and outcome indicators had yet to be achieved, so the research continued to cycle II.

Figure 2. Students are Accessing Card Contents Through QR Code Scanning

In Cycle II, the planning and implementation process of learning is the same as in Cycle I. Only the material and the QR Code card content are different. The results show that the achievement of the teacher's learning process aspect in cycle II is in the Good category. The achievement of the student's learning process reaches the success indicator so that the student obtains a suitable qualification. There are changes in student learning conditions in the classroom in cycle II, such as students can work together well with their card partners and are no longer selective about group friends, students' self-confidence has also increased, students have competed with other group partners to present their group worksheets in front of the class, students also feel that the teacher can convey the material well, the results of the categorization of the student learning motivation questionnaire are that out of 15 students there are still nine students or 60% who are still not in the excellent category of learning motivation.

Figure 3. Example of QR Code Card Cycle II

Furthermore, the researcher's reflection during the implementation of classroom actions found several areas for improvement. Namely, several students became sluggish when they were in the middle of learning until the end of the learning process, students ignored other group partners when doing presentations, and teachers needed to explore quiet students. They allowed them to ask or answer questions, so based on several shortcomings the researcher found and the learning motivation outcome category not being achieved; the research continued to cycle III.

Figure 4. Students collaborated to follow the ICM learning steps by playing QR Code cards.

In Cycle III, the planning and implementation process of learning was the same as in Cycle I and II. The only differences were the learning materials and the contents of the QR Code cards. The achievement of the learning process by implementing the ICM learning model with the QR Code Card in the teacher aspect in cycle III was in the Good category. In the student aspect, it had reached the Good qualification. As for student learning motivation, it showed that out of 15 students, 73% already had a goo and very good qualification for learning motivation. Based on the overall results of the activities that had been carried out in Cycle I, cycle II, and Cycle III, it can be concluded that the implementation of Cycle III had achieved the success indicators that had been set so that the research did not need to be continued to the next cycle and with this the research was stopped.

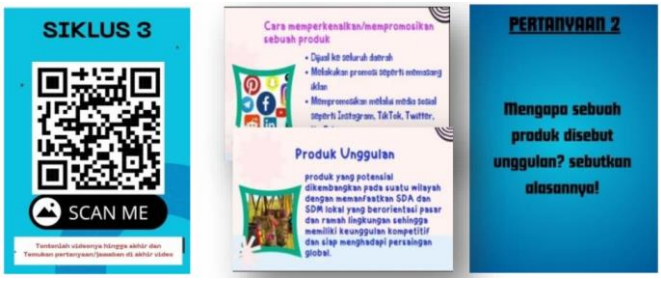

Figure 5. Example of QR Code Card Cycle III

Based on the description above, a simple description of student learning motivation in cycles I, II, and III can be seen in the table 1.

Table 1. Student Learning Motivation Categorization for Each Cycle

Skore	Categori-zation	cycles I		cycles II		cycles IIII	
		n	%	n	%	n	%
0-20	Very Low	0	0	0	0	0	0
21-40	Low	3	20	2	13	0	0
41-60	Moderate	8	54	7	47	4	27
61-80	**Eexcellent**	3	20	3	20	7	46
81-100	Very **Excellent**	1	6	3	20	4	27
Total		15	100	15	100	15	100

This study was conducted to increase the learning motivation of fifth-grade students of UPTD SD Negeri 57 Parepare in Science by applying the ICM learning model with QR code cards. Ni'mah & Syarifuddin, (2023)stated that the ICM model is suitable for use in class and creates a pleasant learning atmosphere for students looking for matching card pairs. Hartiningrum & Ula, (2019) explained that the ICM model uses many practice questions so that students do not feel bored and tired and do not realize that the learning process is taking place.Furthermore, Syamsiahet al. (2023) stated that picture cards with QR codes can increase teacher creativity and create a pleasant learning atmosphere. This classroom action research was conducted at UPTD SD Negeri 57 Parepare, Parepare City, South Sulawesi. The subjects of this study were 16 fifth-grade students of UPTD SD Negeri 57 Parepare consisting of 5 female students, 10 male students, and 1 class teacher. Classroom action research was implemented using research procedures by applying the ICM learning model with learning steps, according toSafangati et al., (2023).Classroom action research consists of 3 cycles; the implementation of each Cycle refers to the research procedure with stages, namely planning, implementation, observation, and reflection.The research was conducted on May 14, 2024, May 21, 2024, and Wednesday, May 22, 2024. The material taught by the researcher in Cycle I was material such as my regional culture, cycle II material on economic conditions in my area, and Cycle III material. In the application of this model, 5th grade students of UPTD SD Negeri 57 Parepare were very enthusiastic about the learning process because students were waiting to be distributed cards in the form of QR code cards containing answers and questions in the form of videos; besides that students were also enthusiastic in participating in learning because students studied while using cellphones. So that in learning, a positive learning atmosphere is built, which is shown by students through their activeness in scanning the QR code card with their cellphone and then matching the answers or questions from their cards with other students in the class.So that the interaction and activeness between students in the class are balanced by matching the cards they have. Therefore, a closer relationship is established between one student and another.

Applying the ICM learning model with QR code cards in Cycle I has impacted student learning motivation. Including the application of ICM, which can encourage student courage. This happened in 5th grade UPTD SD Negeri 57 Parepare. Namely, students seemed/seemed to dare to ask the teacher when they did not understand the subject matter given; this courage and confidence are essential for student learning. This is the opinion ofDwiyanti (2020). In addition, the implementation encourages the development of an attitude of respecting other people's opinions. This happened in 5th grade UPTD SD Negeri 57 Parepare. Namely, students appeared/were seen applauding other groups that had performed in front of the class and giving a sense of mutual respect among students. In addition, the implementation encourages the development of an attitude of respecting other people's opinions. This happened in 5th grade UPTD SD

Negeri 57 Parepare. Namely, students appeared/were seen applauding other groups that had performed in front of the class and giving a sense of mutual respect among students. In addition, the implementation of increasing student involvement in learning activities. This happened in 5th grade UPTD SD Negeri 57 Parepare. Namely, students appeared/were enthusiastic about looking for matching card pairs during the learning process.during the learning process in the classroom, students looked happy and enthusiastic about participating in learning using smartphones by scanning the QR code cards they had. Picture cards combined with QR codes can increase teacher creativity and create a pleasant learning atmosphere (Muflihah, 2021; Durak et al., 2016; Law & So, 2010; Mileva & Stoyanova, 2017; Shen et al., 2023; Sondhi & Kumar, 2022; Wayase, 2015).

In cycle II, the results of teacher observations in implementing the ICM learning model with QR code cards also obtained student learning motivation who were able to listen to learning materials better; this is in line with the opinion of Handayani (Hasyim, 2020) who stated that the advantages of the ICM learning model are that the material presented is more interesting to attract students' attention. In addition, students become confident to appear in front of the class when it is time for presentations. In cycle III, changes in the learning process and motivation were also obtained in students when participating in learning, including students remaining enthusiastic about participating in learning until the end. This is the opinion ofHartiningrum & Ula, (2019) who explained that the ICM model uses many practice questions so students do not feel bored and tired. They need to realize that the learning process is taking place.

The results from cycles I, II, and III are based on the researcher's hypothesis. It is proven that the entire process carried out, starting from the planning, implementation, observation, and reflection processes, shows that implementing the ICM learning model with QR code cards in 5th grade UPTD SD Negeri 57 Parepare, it can improve the learning process and motivation of students. Learning motivation in cycle, I showed that there were still 73% of students whose learning motivation was not categorized as good; in cycle II, there were 60% of students had reached the excellent category, and in cycle III, 72% of students were categorized as good in their learning motivation. Thus, the action of implementing the ICM learning model with QR Code cards was able to encourage an increase in the learning motivation of elementary school students.

Combining the index card match learning model with QR code cards can create a dynamic and engaging learning environment that boosts elementary students' motivation and academic performance. Combining the index card match learning model with QR code cards can be an effective way to increase elementary school students' learning motivation for several reasons. First, the combination of index card matches with QR codes makes learning interactive and engaging (Bauer, 2016; Deng et al., 2014; Kordaki & Gousiou, 2017). Students are not just passively receiving information but actively participating in a game-like activity that can make learning fun. Second, QR codes can link to various multimedia resources (videos, images, audio files, interactive quizzes) that cater to different learning styles (Chin et al., 2015; Kordaki & Gousiou, 2017; Sophie Chang et al., 2022). This can help to address the diverse needs of students and enhance their understanding of the material. Third, the element of a match game introduces gamification into the learning process. Gamification can significantly boost motivation and engagement, as students are naturally inclined to enjoy games and challenges (Alsawaier, 2018; Buckley & Doyle, 2016; Rigby, 2015; Yung et al., 2020). Fourth, this approach encourages collaboration among students as they work together to find matches and scan QR codes, fostering teamwork and communication skills (Rivers, 2009). Fifth, Incorporating technology into learning through QR codes prepares students for the digital age, making them more comfortable and proficient with technology (Zurmehly & Adams, 2017).

Conclusion

Based on the research questions and the results, it can be concluded that 1) applying the ICM learning model with a QR code card can improve students' learning process in 5th grade UPTD SD Negeri 57 Parepare; 2) applying the ICM learning model with a QR code card can improve students' learning motivation in 5th grade UPTD SD Negeri 57 Parepare.

Based on the research results, here are some recommendations that are considered essential to consider, implement, and convey. Teachers should use the ICM learning model with a QR code card by paying attention to student devices' availability and checking whether the network at the school where the research is conducted has internet access that allows them to use internet-based media. It is better to use durable media when making cards, for example, using thicker tripleku card media so that it is not easily damaged; for making QR codes, it is recommended to make your own so that it does not expire so that it can be used for learning in the following year for new students in the same class. For schools, implementing the ICM learning model with QR code cards can be one of the efforts to make schools even better, especially in terms of the quality of learning

in schools. For other researchers, the results of this study can be a reference for further research related to integrating learning models with learning media. Further researchers can examine the integration of QR code media with other relevant learning models.

References

Ai Muflihah. (2021). Meningkatkan Motivasi Dan Hasil Belajar Siswa Melalui Model Pembelajaran Index Card Match Pada Pelajaran Matematika. *Jurnal Pendidikan Indonesia*, *2*(1), 152–160. https://doi.org/10.36418/japendi.v2i1.86

Albina, M., Safi'i, A., Gunawan, Mhd. A., Wibowo, M. T., Sitepu, N. A. S., & Ardiyanti, R. (2022). Model Pembelajaran Di Abad Ke 21. *Warta Dharmawangsa*, *16*(4), 939–955. https://doi.org/10.46576/wdw.v16i4.2446

Alsawaier, R. S. (2018). The effect of gamification on motivation and engagement. *The International Journal of Information and Learning Technology*, *35*(1), 56–79. https://doi.org/10.1108/IJILT-02-2017-0009

Bauer, B. S. (2016, June 25). *Card Games Creation as a Learning Method*. Design Research Society Conference 2016, Brighton, United Kingdom. https://doi.org/10.21606/drs.2016.358

BSKAP Kemendikbudristek. (2022). *Capaian Pembelajaran Mata Pelajaran Ilmu Pengetahuan Alam dan Sosial (IPAS) Fase A – Fase C*. BSKAP. https://kurikulum.kemdikbud.go.id/file/cp/dasmen/13.%20CP%20IPAS.pdf

Buckley, P., & Doyle, E. (2016). Gamification and student motivation. *Interactive Learning Environments*, *24*(6), 1162–1175. https://doi.org/10.1080/10494820.2014.964263

Chin, K.-Y., Lee, K.-F., & Chen, Y.-L. (2015). Impact on Student Motivation by Using a QR-Based U-Learning Material Production System to Create Authentic Learning Experiences. *IEEE Transactions on Learning Technologies*, *8*(4), 367–382. https://doi.org/10.1109/TLT.2015.2416717

D, S., Nasri, S. H., & Suarlin, B. (2023). Penggunaan Kartu Bergambar Berbasis Qr Code Untuk Meningkatkan Hasil Belajar Bahasa Indonesia Kelas V SD Negeri 35 Sangtempe. *Jurnal Publikasi Pendidikan*, *13*(3), 170–176.

Deng, Y., Antle, A. N., & Neustaedter, C. (2014). Tango cards: A card-based design tool for informing the design of tangible learning games. *Proceedings of the 2014 Conference on Designing Interactive Systems*, 695–704. https://doi.org/10.1145/2598510.2598601

Durak, G., Ozkeskin, E. E., & Ataizi, M. (2016). QR Codes In Education and Communication. *Turkish Online Journal of Distance Education*, *17*(2), 42–58. https://doi.org/10.17718/tojde.89156

Dwiyanti, E. (2020). Workshop Nasional Penguatan Kompetensi Guru Sekolah Dasar SHEs: Conference Series 3 (3) (2020) 1616– 1620. *SHEs: Conference Series*, *3*(3), 1616–162o.

Elliott, J. (2001). *Action Research for Educational Change*. Open University Press.

Endang Pudjiasuti Sartinah, E., Pudjiasuti Sartinah, E., & Cindy Setyowati, F. (2019). The Use of Modified Index Card Match to Enhance Social Interaction of Children with Intellectual Disability. *Proceedings of the 5th International Conference on Education and Technology (ICET 2019)*. Proceedings of the 5th International Conference on Education and Technology (ICET 2019), Kota Batu, Jawa Timur, Indonesia. https://doi.org/10.2991/icet-19.2019.20

Fadli, M. R. (2021). Memahami desain metode penelitian kualitatif. *Humanika*, *21*(1), 33–54.

Hardiansyah, F., AR, M. M., & Hidayatillah, Y. (2022). IPAS Learning Assessment To Measure Science Process Skill In Elementary School. *Journal of Elementary Education*, *6*(4), 612–623.

Hartiningrum, E. S. N., & Ula, N. S. (2019). Pengaruh Model Pembelajaran Kooperatif Tipe Index Card Match terhadap Hasil Belajar Matematika Siswa. *Al-Khwarizmi: Jurnal Pendidikan Matematika dan Ilmu Pengetahuan Alam*, *7*(2), 79–86. https://doi.org/10.24256/jpmipa.v7i2.707

Hasyim, A. (2020). Pelaksanaan Strategi Index Card Match Secara Daring Dalam Meningkatkan Hasil Belajar Tematik Sub Tema Aku Merawat Tubuhku Semester Ganjil Pada Siswa Kelas I Mi Mambaul Ulum Umbulsari Kabupaten Jember Tahun Pelajaran 2020/202. *Jurnal PESAT*, *6*(3), 73–94.

Hati, S. T. (2021). Social Studies Education Responding to the Challenges of the 21st Century: A Critique of Learning Practices in Elementary Education. *Jurnal Basicedu*, *5*(6), 5573–5582. https://doi.org/10.31004/basicedu.v5i6.1718

Karima, M. K. (2018). Permasalahan Pembelajaran IPS dan Strategi Jitu Pemecahannya. *ITTIHAD*, *11*(1), 43–53.

Kordaki, M., & Gousiou, A. (2017). Digital card games in education: A ten year systematic review. *Computers & Education*, *109*, 122–161. https://doi.org/10.1016/j.compedu.2017.02.011

Law, C., & So, S. (2010). QR Codes in Education. *Journal of Educational Technology Development and Exchange*, *3*(1), 85–100.

Mileva, N., & Stoyanova, D. (2017). *A Methodological Approach For Using Qr Codes In Education*. *1*, 8481–8486. https://doi.org/10.21125/iceri.2017.2296

Nazariah, S. (2020). Pengaruh Model Pembelajaran Index Card Match terhadap Motivasi dan Hasil Belajar pada Pelajaran IPS Kelas V. *Journal of Education*, *3*(2), 147–157.

Ni'mah, L., & Syarifuddin. (2023). Pengaruh Model Pembelajaran Index Card Match Terhadap Penguasaan Mufradat Siswa Madrasah Diniyah Bahrul Ulum Coban Blimbing Wonorejo. *Jurnal Mu'allim*, *5*(1), 147–158.

Parni. (2020). Pembelajaran Ips Di Sekolah DASAR. *Jurnal Kajian Perbatasan Antarnegara*, *3*(2), 96–105.

Rigby, C. S. (2015). Gamification and Motivation. In S. P. Walz & S. Deterding (Eds.), *The Gameful World* (pp. 113–138). The MIT Press. https://doi.org/10.7551/mitpress/9788.003.0008

Rivers, D. J. (2009). Utilizing the Quick Response (QR) Code within a Japanese EFL environment. *The JALT CALL Journal*, *5*(2), 15–28. https://doi.org/10.29140/jaltcall.v5n2.77

Safangati, N. U., Rini, J., Rohman, A. D., & Yani, M. R. (2023). Penerapan Metode Index Card Match Dalam Meningkatkan Hasil Belajar Pada Tema 3 Kelas I E Madrasah Ibtidaiyah Istiqomah Sambas Purbalingga Tahun Pelajaran 2022/2023. *Seminar Nasional PGMI 2023*, 381–393.

Shen, Y., Yin, X., Jiang, Y., Kong, L., Li, S., & Zeng, H. (2023). "QR Code" Application in Education and Teaching. In Y. Shen, X. Yin, Y. Jiang, L. Kong, S. Li, & H. Zeng, *Case Studies of Information Technology Application in Education* (pp. 85–87). Springer Nature Singapore. https://doi.org/10.1007/978-981-19-9650-4_14

Sondhi, A., & Kumar, Dr. R. (2022). QR Codes in Education: A Review. *International Journal of Scientific Research in Science and Technology*, 193–205. https://doi.org/10.32628/IJSRST229118

Sophie Chang, C.-H., Kuo, C.-C., Hou, H.-T., & Ying Koe, J. J. (2022). Design and evaluation of a multi-sensory scaffolding gamification science course with mobile technology for learners with total blindness. *Computers in Human Behavior*, *128*, 107085. https://doi.org/10.1016/j.chb.2021.107085

Uno, H. (2014). *Teori Motivasi dan Pengukurannya: Analisis di Bidang Pendidikan*. Bumi Aksara.

Wayase, U. R. (2015). QR Code: An innovative teaching learning tool. *International Journal of Innovative Science, Engineering & Technology*, *2*(7), 402–405.

White, C. (1997). Indonesian Social Studies Education: A Critical Analysis. *The Social Studies*, *88*(2), 87–92. https://doi.org/10.1080/00377999709603753

Yonanada, A. (2017). Improvement of Social Science Learning Result Using Index Card Match Learning Model. *Proceedings of the 3rd International Conference on Education and Training (ICET 2017)*. 3rd International Conference on Education and Training (ICET 2017), Batu City, Indonesia. https://doi.org/10.2991/icet-17.2017.14

Yung, O. C., Junaini, S. N., Kamal, A. A., & Md Ibrahim, L. F. (2020). 1 Slash 100%: Gamification of mathematics with hybrid QR-based card game. *Indonesian Journal of Electrical Engineering and Computer Science*, *20*(3), 1453. https://doi.org/10.11591/ijeecs.v20.i3.pp1453-1459

Zurmehly, J., & Adams, K. (2017). Using Quick Response Codes in the Classroom: Quality Outcomes. *CIN: Computers, Informatics, Nursing*, *35*(10), 505–511. https://doi.org/10.1097/CIN.0000000000000363