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Enhancing Children's Emotion Regulation Through Educational Puppets With QR Code Technology

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Abstract

Children aged 4–6 years often encounter challenges in recognizing, understanding, and managing their emotions, which underscores the importance of engaging and interactive learning media. Puppets have long served as effective educational tools that support children's social and emotional development. This study aims to design and evaluate a QR code–based emotion puppet as a medium to assist early childhood in emotional regulation. Referring to Paul Ekman's six basic emotions—happiness, sadness, anger, fear, surprise, and disgust—the puppet introduces these emotions through features linked to QR codes that direct users to educational videos. These videos provide interactive guidance on identifying emotions, expressing them appropriately, and applying suitable regulation strategies. A quasi-experimental approach was employed with 19 preschool children participating, though only 12 valid data sets were used for analysis. The findings reveal that the intervention led to improvements in children's abilities to recognize, express, and regulate their emotions more effectively. Children also became more open in communicating their feelings with others. Additionally, the interactive puppet successfully attracted children's interest in the emotional learning process, promoting deeper engagement in exploring emotions. Overall, the results suggest that the QR code–based emotion puppet is an effective educational medium that supports emotional regulation and helps strengthen social skills in early childhood.

Keywords: emotion regulation, educational puppets, QR code, socio-emotional development, interactive learning

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INTRODUCTION

Emotional regulation is a fundamental skill developed during early childhood, especially between the ages of 4–6 years, when children begin to encounter a wide range of emotional experiences. However, many still struggle to identify and express their emotions in socially appropriate ways (Papalia & Martorell, 2014). Difficulties in managing emotions can lead to behavioral issues and negatively impact social development (Roll et al., 2012).

Educational puppets have long been used as an effective tool to support children's emotional understanding through symbolic play and role-play (Piaget, 1962; Erikson, 1950). Puppetry has been recognized as a valuable tool in early childhood programs, enhancing various developmental domains including cognitive, social, and emotional skills (Luen, 2021). QR code emotion puppet.

Recent advances, such as QR codes, offer new ways to create interactive emotional learning experiences. These innovations align with modern educational approaches that emphasize active, engaging, and media-rich environments (Hayati & Syaikhu, 2020; Amir et al., 2024). Studies show that such approaches not only improve emotional regulation but also promote broader developmental gains (Amir et al., 2024).

This study proposes the development of a QR code-based emotion puppet designed to help children recognize, name, and manage basic emotions—namely happiness, sadness, anger, fear, disappointment, and disgust, based on Ekman's (1992) theory of universal emotions. Each emotion doll will feature a unique QR code that links to a short, age-appropriate animated video or interactive activity that demonstrates the corresponding emotion. Through interactive videos accessed via QR code, the dolls aim to facilitate emotional expression in a fun and engaging way. By combining traditional puppet play with digital media, this approach seeks to improve children's emotional regulation and encourage positive social interactions in an early learning environment. Through interactive videos accessed via QR codes, the puppet aims to facilitate emotional expression in a playful and engaging way. By combining traditional puppet play with digital media, this approach seeks to enhance children's emotional regulation and promote positive social interactions in early learning settings.

RESEARCH METHOD

This research adopts a quantitative descriptive approach and utilizes a quasi-experimental design. The method involves a single group that receives a treatment or intervention, without comparison to another group. A quasi-experiment closely resembles an experimental study in its structured observation and procedures, but it lacks full control over participants' conditions and experiences particularly due to the absence of random assignment, such as in selecting control groups. According to Hastjarjo (2019), although this type of research seeks to examine relationships by including both experimental and control groups, the selection of these groups does not involve randomization. Quasi-experimental designs are often chosen in social or educational research due to the challenges in controlling external variables especially within classroom settings. In educational environments, students naturally interact with one another and their surroundings, making it difficult to implement strict controls. Moreover, it is not always feasible to randomly assign participants, as classroom groups are typically pre-existing or naturally formed intact groups, such as students within a single class. These groups are usually small in number, and therefore, the strict criteria of true experimental research cannot be fully applied. As a result, researchers use quasi-experimental methods that accommodate these intact group structures.

Research Design

In this study, participants were given treatment in the form of an intervention using QR code- based emotion doll media, which aims to improve emotion regulation skills in preschool children. Data collection was carried out through pretest and posttest measurements to assess changes in the level of emotion regulation. On the first day, a pretest was conducted to obtain initial data

related to children's emotion regulation abilities. Children were divided into several small groups to make the atmosphere more conducive and facilitate the assistance process. Each group was facilitated by one researcher. The instrument used was a sticker-based questionnaire, where children were asked to put stickers on the pictures that best represented their feelings or reactions in certain situations. This technique was chosen because it is suitable for early childhood cognitive and communication abilities, and helps to create a fun and unburdening atmosphere. The posttest was conducted after the intervention ended, with a similar approach but with the use of visual media in the form of PowerPoint slides shown in front of the class. This was to save time and keep the children's attention during the completion process. Three researchers again assisted the children in completing the sticker-based questionnaire individually.

Research Subject

The subjects in this study consisted of children aged 4-6 years, which is the age group of preschool children. This study was conducted in one of the kindergartens (TK) located in Central Jakarta. The participants involved in this study were children who were included in the TK-B group, with a total of 12 children. Of the total participants, there were 7 boys with a percentage of 58.3% and 5 girls with a percentage of 41.7%. This composition reflects the gender differences that exist among the participants who are the subjects of this study.

Research Variables and Instruments

The instruments used in this study were pretest and posttest questionnaires specifically designed to measure changes in children's ability to recognize and manage six basic emotions, namely happy, sad, angry, afraid, disgusted, and surprised, as explained in the theory of basic emotions by Ekman (1992). The questionnaire was designed with an approach that is in accordance with the developmental characteristics of preschool children (4–6 years), namely using visual media and sticker-based responses. Each item in the questionnaire presents an illustration of a simple emotional situation that represents one of the six basic emotions. Children are asked to choose and attach a sticker to the facial expression that they think is most appropriate to the situation shown. The pretest questionnaire was given in the initial session to measure children's initial ability to recognize and express emotions. Meanwhile, the posttest questionnaire was given after the entire series of interventions were completed to initiate changes or improve children's understanding of these basic emotions. The use of the sticker method aims to make it easier for children to respond without having to use complex verbal skills, as well as to create a more enjoyable and interactive filling atmosphere. In addition, in the implementation of the posttest, the questionnaire was accompanied by visual media assistance in the form of PowerPoint slides to maintain children's attention and speed up the implementation process. During the questionnaire filling, the researcher accompanied directly to provide direction if needed, without influencing the child's choice. This approach is expected to provide more representative results of the child's emotional regulation abilities before and after the intervention.

RESULTS AND DISCUSSION

Reliability and Validity of the Emotional Regulation Instrument

The survey was conducted with a total of 19 respondents. Out of these, 12 responses were considered valid, while 7 were excluded as they involved children with special needs. Below are the key findings gathered from the valid responses in the survey.

Table 1. Reliability Analysis of Pretest Questionnaire

Cronbach's Alpha	N of Items
,875	30

Table 1 shows a Cronbach's Alpha of 0.875, which means the instrument is highly reliable since
it is well above 0.6.

Table 2. Reliability Analysis of Posttest Questionnaire

Cronbach's Alpha	N of Items
,925	30

Table 2 shows a Cronbach's Alpha of 0.925, which means the instrument is highly reliable since it is well above 0.6.

The reliability analysis showed that the instrument used in this study had excellent internal consistency, with a Cronbach's Alpha of 0.875 (pretest) and 0.925 (posttest). These values indicate that the items were strongly correlated and reliable for assessing emotional regulation in early childhood.

Table 3. Validity Analysis of Pretest Questionnaire

		Happiness Total	Sadness Total	Angry Total	Fear Total	Surprise Total	Disgust Total
Happiness Total	Pearson Correlation	1	,577*	,101	,183	,194	,003
	Sig. (2-tailed)		,050	,755	,570	,545	,992
Sadness Total	Pearson Correlation	,577*	1	,235	,181	,251	,487
	Sig. (2-tailed)	,050		,462	,574	,431	,108
Angry Total	Pearson Correlation	,101	,235	1	,795**	,719**	,747**
	Sig. (2-tailed)	,755	,462		,002	,008	,005
Fear Total	Pearson Correlation	,183	,181	,795**	1	,604**	,455
	Sig. (2-tailed)	,570	,574	,002		,037	,137
Surprise Total	Pearson Correlation	,194	,251	,719**	,604*	1	,718**
	Sig. (2-tailed)	,545	,431	,008	,037		,009
Disgust Total	Pearson Correlation	,003	,487	,747**	,455	,718**	1
	Sig. (2-tailed)	,992	,108	,005	,137	,009	

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

Table 4. Validity Analysis of Posttest Questionnaire

		Happiness Total	Sadness Total	Angry Total	Fear Total	Surprise Total	Disgust Total
Happiness Total	Pearson Correlation	1	-,092*	,211	,420	,347	,012
	Sig. (2-tailed)		,777	,510	,173	,270	,970
Sadness Total	Pearson Correlation	-,092*	1	,337	,593	,725	,470
	Sig. (2-tailed)	,777		,284	,042	,008	,123
Angry Total	Pearson Correlation	,211	,337	1	,040	,100	,440
	Sig. (2-tailed)	,510	,284		,901	,756	,005
Fear Total	Pearson Correlation	,420	,593*	,040	1	,927**	,250
	Sig. (2-tailed)	,173	,042	,901		,000	,434
Surprise Total	Pearson Correlation	,347	,725**	,100	,927**	1	,183
	Sig. (2-tailed)	,270	,008	,756	,000		,569
Disgust Total	Pearson Correlation	,012	,470	,246	,250	,183	1
	Sig. (2-tailed)	,970	,123	,440	,434	,569	

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

The validity analysis confirmed that most items had significant correlations with their respective constructs. However, some items did not meet the validity threshold and were removed from further analysis. This ensured that only accurate and relevant items were included to measure the intended emotional aspects.

Paired T-Test

Table 5. Paired Sample Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	50,8333	12	3,71320	1,07191
	Posttest	62,5000	12	4,46196	1,28806

Table 6. Paired Sample Correlations

		N	Correlation	Sig.
Pair 1	Pretest - Posttest	12	,406	,190

Table 7. Paired Samples Test

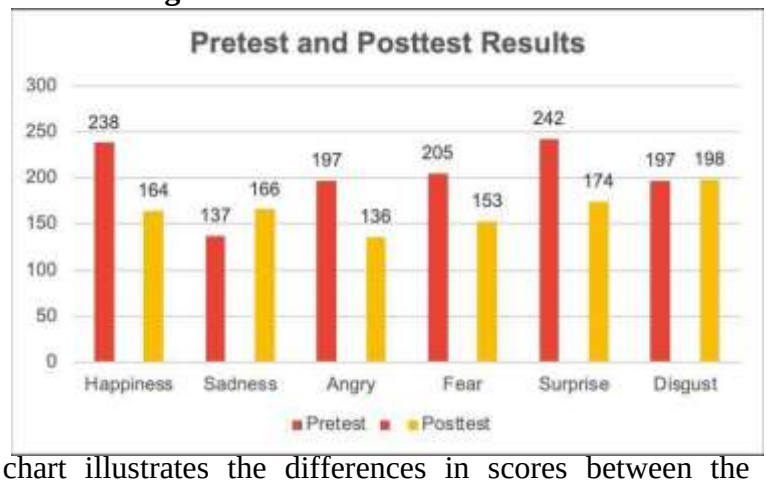
		Paired Differences					t	df	Sig (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pretest - Posttest	-11,66667	4,49916	1,29880	-14,52530	-8,80804	-8,983	11	,000

Table 7 results of the Paired Sample T-Test reveal a significant difference between the pretest and posttest scores. The mean score increased from 50.83 (pretest) to 62.50 (posttest), with a t- value of -8.983, 11 degrees of freedom (df),

and a p-value of 0.000 ($p < 0.05$), indicating that the intervention was effective in improving the posttest scores.

This mean difference is further supported by the Paired Samples Test table, where the mean difference (pretest – posttest) is -11.67, showing that the posttest scores were consistently higher than the pretest scores. The standard error of this difference is 1.29, suggesting data stability.

Figure 1. Pretest and Posttest Results



The chart illustrates the differences in scores between the pretest and posttest across six types of emotions experienced by children before and after being introduced to educational puppets. The values shown in the diagram were obtained by directly totaling the scores for each emotion during the pretest and posttest phases. These differences indicate that after the explanation using educational puppets, children became more capable of recognizing and expressing a wider range of emotions, including those that might have previously gone unnoticed or were difficult to articulate. Before the intervention, children tended to mention emotions they perceived as "good" or easier to recognize, such as happiness. However, after understanding that all emotions are valid and important to acknowledge, they began to identify feelings like anger, sadness, fear, and disgust more accurately. Therefore, the score differences between the pretest and posttest reflect a significant improvement in emotional awareness and understanding following the intervention.

The increase in emotional regulation scores from pretest to posttest shows that the QR code- based emotion puppet was effective in helping children aged 4–6 years better recognize, express, and manage their emotions. The combination of puppets with changeable facial expressions and animated videos made learning more fun and engaging. This supports the idea that early childhood is a critical period for developing emotional understanding, as emphasized by Ekman (1992), and aligns with previous research showing that visual, interactive media are effective in teaching emotions.

The improvement in posttest results suggests that the puppet intervention helped children recognize and manage their emotions more effectively. This aligns with findings from Mwariko (2023), who noted that teacher-facilitated play-based learning, especially within STEAM domains, can foster not only cognitive but also emotional development in early childhood settings.

Furthermore, recent research has highlighted that while play-based methods

are widely supported, practitioners often face challenges in implementation, including curriculum pressure and lack of training (Fong Jia Yean & Ngadni, 2024). This indicates the need for systemic support when introducing innovation such as puppet-based interventions.

This finding aligns with another research. For example, Karaolis (2021) emphasized that puppets in the classroom foster stronger connections between teachers and children, while boosting children's self-confidence and communication skills. Similarly, the "Feel Your Best Self" program integrates puppets with coping strategies and found positive emotional outcomes in young children (Colorín Colorado).

The strengths of this study include the use of engaging, child-friendly media that combines traditional puppet play with digital technology. The high reliability of the instruments further strengthens the results. The statistical analysis using paired sample t-tests also showed significant improvements, with a practical increase of 11.67 points, supporting the effectiveness of the intervention. In short, the study confirms that combining puppets with digital technology (such as QR-linked videos) enhances children's ability to recognize, express, and manage their emotions effectively.

However, there are limitations. The study was conducted over only five days in a single preschool, which limits the generalizability and long-term impact of the findings. The small sample size (N = 12) may also reduce statistical power and generalizability. Additionally, the weak correlation between pretest and posttest scores (0.406, $p = 0.190$) suggests that other uncontrolled variables could have influenced the results. The absence of follow-up measurements makes it difficult to assess whether the improvements are sustained over time. Future research should involve larger sample sizes, longer durations, and more diverse settings to further test the method’s effectiveness.

CONCLUSION

This study showed that using a QR code-based emotion puppet can help children aged 4-6 years improve their emotional regulation. The puppet, with its fun and interactive design, made it easier for children to recognize, express, and manage their emotions. Using visual and gamified learning methods worked well because young children respond better to visuals, making the learning process both fun and effective.

The results suggest that the QR code-based emotion puppet is a great tool for early childhood education. It helps children develop emotional intelligence and social skills in an engaging way. This method encourages children to learn about emotions while playing, which leads to better emotional expression and understanding. It is recommended that this tool be used in early childhood programs to support emotional learning. Future studies could look into how long the benefits last and how this method can work in different cultural settings.

Integrating puppet-based media into emotional learning reflects a broader shift toward play- based and child-centered education. As supported by recent studies, this method not only improves emotional regulation but also aligns with how children naturally learn through interactive, imaginative play (Misrahayu, 2024; Amir et al., 2024).

It is recommended that this tool be used in early childhood programs to support emotional learning. Future studies could look into how long the benefits last and how this method can work in different cultural settings.

BIBLIOGRAPHY

Abraham, I., & Supriyati, Y. (2022). Desain kuasi eksperimen dalam pendidikan: Literatur review. Jurnal Ilmiah Mandala Education, 8(3). https://doi.org/10.58258/jime.v8i3.3800

Amir, I., Rohmadheny, P. S., Purnama, S., Rosada, U. D., & Maharani, E. A. (n.d.). Play-based learning in practice: An exploration of early childhood education teacher's experiences in Yogyakarta City. Journalof Early Childhood Care and Education. https://doi.org/10.26555/jecce.v7i2.10948

Anderson, L. (2022). The role of dolls in emotional learning for young children. Early Childhood Education Journal, 50(3), 245–257.

Colorado, C. (2023). How puppets are teaching kids to "feel your best self.". WETA. https://www.colorincolorado.org/article/how-puppets-are-teaching-kids-feel-your-best-self

Ekman, P. (1992). An argument for basic emotions. Cognition and Emotion, 6(3–4), 169–200. https://doi.org/10.1080/02699939208411068

Karaolis, O. (2021, August 19). No strings attached: Supporting social and emotional learning with puppets. Edutopia. https://www.edutopia.org/article/no-strings-attached-supporting- social-and-emotional-learning-puppets/

Hayati, M., & Syaikhu, A. (2020). Project-based learning in media learning material development for early childhood education. Al-Athfal: Jurnal Pendidikan Anak, 6(2), 147–160. https://doi.org/10.14421/al-athfal.2020.62-05

Mwariko, D. (2023). The role of teachers in promoting play-based learning in STEAM education in early childhood education. Cakrawala Dini: Jurnal Pendidikan Anak Usia Dini, 14(1). https://ejournal.upi.edu/index.php/cakrawaladini/article/view/74417

Özdil, G., Simsek, F. M., & Tuğluk, M. N. (2021). Comparison of digital assessment and documentation systems used in the early childhood education in Turkey, Germany and Spain. Southeast Asia Early Childhood Journal, 10(2), 1-15. https://doi.org/10.37134/saecj.vol10.2.1.2021

Papalia, D. E., & Martorell, G. (2014). Experience Human Development (12th ed.). New York, NY: McGraw-Hill Education.

Roll, S., Koglin, U., & Petermann, F. (2012). Emotion regulation strategies in preschool children. The British Journal of Developmental Psychology.

Taylor, M. E., & Boyer, W. (2019, October 31). Play-based learning: Evidence-based research to improve children's learning experiences in the kindergarten classroom - early childhood education journal. SpringerLink.https://link.springer.com/article/10.1007/s10643-019-00989-7

William, W., & Hita, H. (2019). Mengukur Tingkat Pemahaman Pelatihan PowerPoint menggunakan quasi-experiment one-group pretest-posttest. Jurnal SIFO Mikroskil, 20(1), 71–80. https://doi.org/10.55601/jsm.v20i1.650

Wilson, R., & Green, C. (2021). Interactive learning in early childhood: The use of toys and puppets in emotion education. Journal of Child Development, 60(4), 312–324.

Yean, F. J., & Ngadni, I. (2024). Play-based learning in Malaysian early childhood education: A study of diploma students' perspectives and challenges. Internationa l Journal of Academic Research in Progressive Education and Development, 13(4), 1663-1665. http://dx.doi.org/10.6007/IJARPED/v13-i4/23143

Zuddas, A. (2012). The role of emotional regulation in early childhood education: The social and cognitive development of preschoolers. Journal of Early Childhood Education