Duet: A Mobile Application to Facilitate Parents in Practicing Coparenting

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A B S T R A K

Dalam meningkatkan motivasi berprestasi pada anak, orangtua membutuhkan alat bantu untuk mengedukasi mengenai co-parenting serta cara mengembangkan motivasi berprestasi pada anak. Orangtua juga membutuhkan sarana untuk mendiskusikan pola pengasuhannya dan monitoring anak-anaknya. Tujuan penelitian ini adalah untuk mengembangkan aplikasi mobile berbasis coparenting. Jenis penelitian ini adalah penelitian pengembangan yang mengikuti model pengembangan ADDIE. Metode pengumpulan data menggunakan kuesioner. Instrument pengumpulan data menggunakan lembar kuesioner. Lembar validasi diisi oleh ahli psikologi, teknologi, dan desain. Selain itu aplikasi ini juga diuji coba oleh 92 orangtua siswa SD kelas 4-6. Teknik analisis data menggunakan analisis deskriptif kualitatif dan kuantitatif. Hasil penelitian yaitu validasi pakar menunjukkan bahwa aplikasi Duet memiliki konten yang sangat sesuai dan bermanfaat untuk menolong orangtua meningkatkan coparenting guna mengembangkan motivasi berprestasi anak (96.30%), sangat reliabel secara teknologi (83.20%), dan memiliki efektivitas desain yang sangat baik (93.33%). Hasil uji coba pada orangtua menunjukkan bahwa aplikasi ini dapat diterima oleh orangtua sangat baik (81.09%). Disimpulkan DUET, aplikasi mobile berbasis coparenting, dapat digunakan untuk sebagai alat bantu bagi orangtua mengembangkan coparenting guna meningkatkan motivasi berprestasi anak. Implikasi penelitian ini yaitu aplikasi mobile berbasis coparenting yang dikembangkan dapat digunakan oleh guru dan orangtua dalam meningkatkan prestasi anak.

A B S T R A K

Increasing achievement motivation in children, parents need tools to educate them about co-parenting and how to develop achievement motivation in children. Parents also need a means to discuss their parenting patterns and monitor their children. This research aims to develop a coparenting-based mobile application. This type of research is development research that follows the ADDIE development model. The data collection method uses a questionnaire. The data collection instrument uses a questionnaire sheet. The validation sheet is filled in by psychology, technology, and design experts. 92 parents of elementary school students also tested this application in grades 4-6. The data analysis technique uses qualitative and quantitative descriptive analysis. The results of the research, namely expert validation, show that the Duet application has content that is very suitable and useful for helping parents improve co-parenting in order to develop children's achievement motivation (96.30%), is very technologically reliable (83.20%), and has very good design effectiveness (93.33%). The results of trials on parents showed that this application was very well accepted by parents (81.09%). It was concluded that DUET, a co-parenting-based mobile application, can be used as a tool for parents to develop co-parenting to increase children's achievement motivation. The implication of this research is that the coparenting-based mobile application developed can be used by teachers and parents to improve children's achievement.

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1.   INTRODUCTION

Achievement motivation drives achievement and success in various aspects of life, which is a critical factor in a child's overall development (Asiyah & Walid, 2019; Trisnowali MS., 2017; Yuliastini et al., 2020). Although schools play an essential role in shaping children's academic motivation, instilling achievement motivation at home must also be considered. The foundation for children's mindset and attitudes toward success is often laid in the family environment, so parental involvement is an essential component in fostering strong motivation and ambition (Deichmann & Ahnert, 2021; Ernawati, 2023; Nofrizal et al., 2020; Pramudyani, 2020). Outside the academic curriculum, parents act as role models and leading influencers in children's lives (Kostyrka-Allchorne et al., 2017; Ni et al., 2021; Pramudyani, 2020). Therefore, incorporating the principles of achievement motivation into the home environment is essential for cultivating a well-rounded and motivated individual. Parents can instill a sense of achievement motivation through various means, such as setting realistic goals, encouraging persistence in facing challenges, and celebrating successes (Knauer et al., 2020; Marr et al., 2021; Tong et al., 2021). By creating a supportive and positive atmosphere at home, parents can foster a growth mindset in their children, emphasizing the importance of effort, learning, and resilience in achieving goals (Özkan Yıldız & Yılmaz, 2021; Rumsari & Nurhayati, 2020).

The development of achievement motivation is rooted in early life experiences, particularly in the formative years of childhood. How parents, educators, and those closest to them respond to children's successes and failures can shape their need for achievement (Dewi et al., 2015; Kostyrka-Allchorne et al., 2017; Nofrizal et al., 2020). Positive reinforcement, encouragement, and celebration of efforts and achievements contribute to the cultivation of solid achievement motivation (Mifsud et al., 2021; Nofrizal et al., 2020). Parents value achievement, relate achievement to their child's talents and efforts, and foster independence in the early years so children will grow up with high achievement motivation. According to recent research, the development of achievement motivation is influenced by certain activities, environments, and settings (Nofrizal et al., 2020). The family environment is the leading educational environment for children, so parents influence their children's achievement motivation (Knauer et al., 2020; Özkan Yıldız & Yılmaz, 2021; Rumsari & Nurhayati, 2020). The family environment is an informal educational institution. Parents can increase children's motivation to achieve success. Paying attention to children's school activities is one way for parents to monitor their children (Cusinato et al., 2020; Nofrizal et al., 2020). Parents' attention (mothers and fathers) to their children's educational activities is one of the factors that influences students' achievement motivation. External and internal factors influence how well students learn at school. The family environment, including how parents raise children, the atmosphere at home, parental understanding, and parental characteristics, can contribute to children's achievement motivation.

The problem currently occurring is that there are still many parents who need help educating their children. Previous research findings also confirm that parents still have difficulty increasing their children's learning motivation (Garzia et al., 2019; Kurniawan & Hermawan, 2020; Maftei et al., 2020). Other research also states that parents' difficulty caring for children is due to a need for appropriate knowledge in caring for children (Botha et al., 2020; Fitri et al., 2020). Apart from that, several other problems include that many parents have divorced, making it challenging to divide roles in caring for children (Pinto et al., 2019; Trisnadi & Andayani, 2021). Children often have difficulty coping with their feelings regarding the emotional disconnection from one parent, especially if that parent does not have full custody. Other research findings also reveal that a lack of communication and cooperation between parents can hinder providing consistent and balanced care (Hartanto & Yuliani, 2019; Sari et al., 2020). Conflict between parents can hurt children's well-being.

Coparenting refers to the participation of both parents in the care of their children, including education, tasks, and choices that impact their children's lives (Pinto et al., 2019; Setiawan et al., 2022). It centers on how parents interact with each other and their perceptions of their role as parents. An empirically grounded ecological framework that conceptualizes co-parenting along four interrelated dimensions: agreement between parents regarding childrearing values and practices, how childrearing tasks are divided between parents, the extent to which parents support and undervalue one another, and how parents co-manage the family together. This requires a high level of tolerance and communication between co-parents. Co-parents must also navigate emerging dynamics and relinquish control over their children and circumstances in which they may disagree. Parents may face many new pressures for their children's good and welfare (Garg & Sengupta, 2020; Setiawan et al., 2022). One of the challenges of co-parenting is maintaining consistency between parents.

Overcoming parenting difficulties together is an ongoing process that can only be achieved once. This requires regular communication and the ability to adapt when new problems arise. Maintaining consistency is vital when facing the ever-changing challenges of co-parenting. To implement co-parenting,

parents need help, support, and tools to help them discuss parenting and supervision of children (Pinto et al., 2019; Setiawan et al., 2022). The mobile application DUET is one tool that can help parents carry out effective co-parenting to increase children's achievement motivation. Information technology has developed to such an extent that people can now solve problems in all areas of life more quickly thanks to the support of smartphones with high mobility and the increasingly developing internet (Astini, Suni, 2020; Syamsuar & Reflianto, 2018; Zaini & Soenarto, 2019). Creating multimedia-based educational applications to improve early childhood learning has utilized web and mobile applications (Anggraini & Sartono, 2019; Engel et al., 2021; Pratiwi & Ismaniati, 2017). Technology interventions positively impact parenting patterns and the emotional health of parents with children (Flujas-Contreras et al., 2019; Pratiwi & Tirtayani, 2021).

Previous research findings also suggest that shared parenting increases children's emotional stability by providing them with a consistent and supportive framework (Merrifield & Gamble, 2013; Pinto et al., 2019). Other findings also state that when parents work harmoniously, children benefit from a sense of security and predictability (Mardliyah et al., 2021; Siregar & Rahmah, 2016; Wisnu & Komang, 2019). Other research also states that using learning media can increase children's motivation to learn (Sri & Suyanta, 2019; Zaini & Dewi, 2017). However, research has yet to be conducted on mobile applications that make it easier for parents to practice co-parenting. The advantages of this collaborative approach are that it helps create a nurturing atmosphere where children feel loved, understood, and better able to face life's challenges. Co-parenting provides a robust role model for children, illustrating the importance of collaboration and teamwork. Watching their parents work together instills valuable life skills, such as effective communication, conflict resolution, and building healthy relationships. These skills, learned within the family unit, can significantly influence a child's interpersonal dynamics and future relationships. Based on this, this research aims to develop a co-parenting-based mobile application to increase children's motivation to achieve. The novelty of this study is provide DUET mobile application was developed to make it easier for parents to implement co-parenting and increase children's achievement motivation.

2. METHOD

This research uses a type of development research. The method in this research was developed from the AADIE model. The ADDIE model is a generic instructional design model that provides an organized process in developing learning materials that can be used in both face-to-face and online learning (Ngussa, 2014; Shelton & Saltsman, 2006). The first stage, analysis, is a process of defining what learners will study. It involves conducting a need assessment, identifying problems or needs, and performing task analysis. The second stage is design, which involves creating a design or blueprint. The third stage is development, which is the process of turning the blueprint or design into a reality in the learning activities. In this stage, e-learning can be developed, and specific platforms for learning can be utilized. The first step in product development is to analyze the system users and determine what users (teachers, administrators, learners) can do within the system. Implementation is the tangible step to deploy the developed learning system. This means that in this stage, everything that has been developed is installed and configured according to its roles and functions so that it can be put into operation. The implementation stage is carried out by testing and trying out the media directly through the learning process. This research involves experts in psychology, technology, and design, as well as parents who will use the application. The evaluation stage in this learning process is carried out until formative evaluation for the purpose of revisions. This is based on the results of expert reviews and field trials that have been conducted during the implementation stage.

The development of the DUET application is the 3rd year of development. In years 1 and 2, the DUET mobile application has completed expert validation and trial on parents so that the application development in the 3rd year is a development of feedback from experts and parents in the previous year. Data collection in this research involved 5 cities, namely Bogor, Tangerang, Jakarta, Manado, and Surabaya. The subjects in this research were 92 parents who had children in grades 4-6 of elementary school. This application trial involves several stages, expert validation including validation from the psychology, informatics and design teams to validate the material or content, in terms of design and IT in the application. The number of experts involved in this research is one person for each field, so there are a total of three experts who will provide reviews or feedback on this application. Each expert will provide feedback and reviews based on their respective fields and the given set of questions. There are 9 indicators in the design field, 6 indicators in the technology field, and 9 indicators in the psychology field. Meanwhile, parents tried the application and provided feedback on the 7 instruments that the researcher has prepared beforehand. The data collection method uses instruments. The data collection instrument uses a questionnaire sheet. The questionnaire grid is presented in Table 1. The validation assessment criteria showed in Table 2.

Table 1. Instrument Grids for Parent Response Instrument

No	Instrument	Indicator
1	Learnability	a. Ease of installation on mobile devices b. Clarity of text within the application c. Ease of access to the buttons within the application d. Ease of access to the main menu within the application e. Clarity of naming the main menu in the application according to its content and function f. Ease and clarity of the initial application guide g. Clarity of the application's flow h. Ease of the authentication process (user registration & login)
2	Efficiency	a. Loading speed in displaying content b. Application's responsiveness to user actions
3	Memorability	a. Ease of users in remembering the names of the main menu b. Ease of users in remembering the functions and content of each main menu c. Ease of users in remembering the names of the buttons within the application d. Speed of users in remembering the location of a feature in the available main menu
4	Error-free	a. Smoothness level during content loading from the application b. Success rate in the installation process c. System stability
5	Satisfaction	a. Application's attractiveness b. Usefulness in helping to co-parent c. Suitability of educational article content according to needs d. Frequency of use of this application e. Willingness to use this application again f. Willingness to recommend this application to other married couples
6	Content Quality	a. The usefulness of the videos and articles in the application to improve the quality of co-parenting in order to develop the motivation for children's achievement. b. The ease of understanding the videos and articles in the application. c. The usefulness of quizzes and questions in the application to assess the understanding of the content of articles and videos presented in each session. d. The usefulness of reflections in each session in the application to improve the quality of co-parenting for the development of children's achievement motivation.
7	Multi-Platform	a. The level of usefulness of the multi-platform in facilitating and enhancing the flexibility of using the application. b. The level of absence of obstacles for parents in using the application with the presence of multi-platform (Android and iOS).

Table 2. Demographic of Parents trying out DUET

No	Demography	Category	Frequency	%	Mean	SD
1	Gender	Male	39	42.39%		
		Female	53	57.61%		
2	Age	31-35	15	16.30%	40.92	4.63
		36-40	26	28.26%		
		41-45	34	36.96%		
		46-50	17	18.48%		
3	Age of Marriage	9-12	53	57.61%	13.22	2.927
		13-16	22	23.91%		
		17-20	16	17.39%		
		21-24	1	1.09%		
4	No.Children	1	27	29.35%	1.91	0.736
		2	48	52.17%		
		3	15	16.30%		
		4	2	2.17%		

The techniques used to analyze data are qualitative descriptive analysis and quantitative descriptive analysis. The qualitative descriptive analysis technique analyzes and describes situations from various data collected in the form of observations regarding the problems being studied in the field (Sugiyono, 2018). Qualitative descriptive analysis is used to analyze data through input provided by experts and parents. Quantitative descriptive analysis technique is a method that aims to create an image or description of a situation objectively using numbers (Sugiyono, 2018). Quantitative descriptive analysis techniques are used to analyze data in the form of scores given by experts and parents.

3. RESULT AND DISCUSSION

Results

This research uses the ADDIE model to develop a co-parenting-based mobile application to increase children's achievement motivation. The results of the analysis for each stage are as follows. First, analyze. The results of the problem analysis are that parents still need help increasing their children's learning motivation. Several other problems include the large number of parents who are divorced, making it challenging to divide roles in raising children. Children often have difficulty coping with their feelings regarding emotional disconnection from one parent, especially if that parent does not have full custody. Conflict between parents can be detrimental to children's well-being. Based on these problems, a co-parenting-based mobile application was developed to increase children's achievement motivation.

Second, design. At this stage, a co-parenting based mobile application design is developed. At this stage, several aspects are presented in the co-parenting-based mobile application: pre-assessment and assessment, video player, and images in articles and videos. Co-parenting based mobile applications present many exciting and supportive articles to educate parents. Some articles can help parents communicate and coordinate in raising children. Third, development. At the development stage, the process of turning the blueprint or design into reality in learning activities is carried out. E-learning can be developed at this stage, and specialized learning platforms can be utilized. The results of co-parenting-based mobile application development are presented in Figure 1.
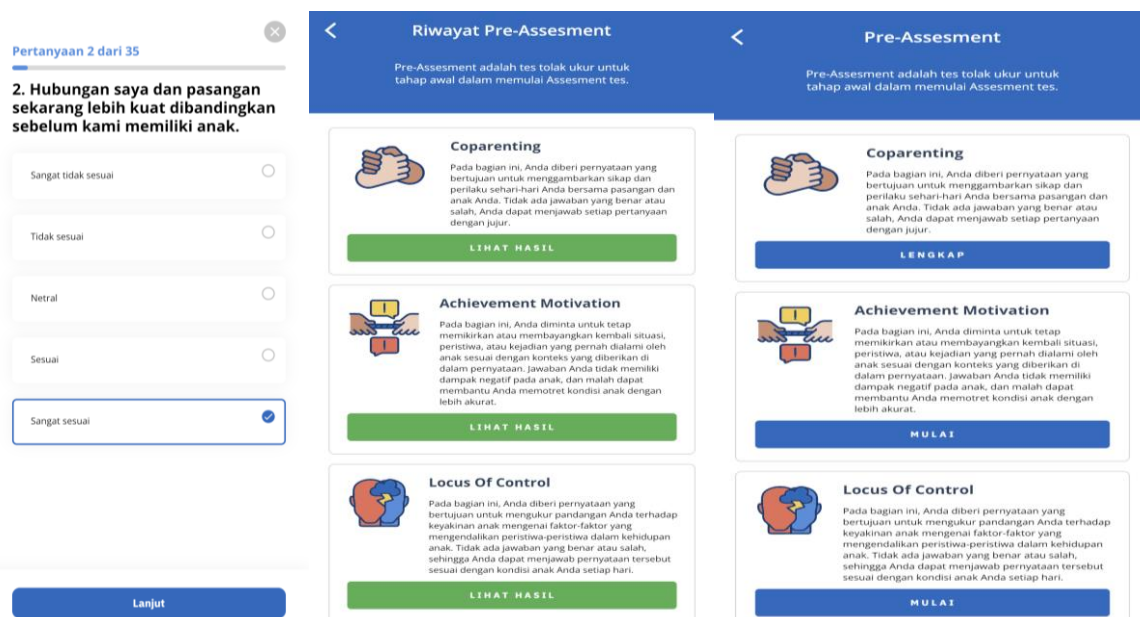

Figure 1. Results of Mobile Application Development Based on Co-Parenting

Fourth is implementation. The activity carried out is implementing the learning system developed. This means that everything that has been developed in this stage is installed and configured according to its role and function so that it can be operated. The implementation stage is done by testing and trying the media directly through the learning process. This research involved experts in psychology, technology and design, as well as parents who will use the application. The results of assesment by Psychology, Technology, and Design experts is presented in Table 3.

Table 3. Validation of Experts

No	Category	Average Score	Percentage	Conclusion
1	Psychology	4.82	96.30	Very Good
2	Technology	4.16	83.20	Very Good
3	Design	4.67	93.33	Very Good

Base on Table 3, the results of expert validation of the mobile coparenting application show that this application is adequate in terms of psychological content, technology, and design. Assessment from a psychology expert aims to check the suitability and quality of the material to assist parents develop coparenting to help their children develop achievement motivation. This application achieved an average of 4.82 out of the total value scale of 5, which is equal to 96.30%. This shows that the content of the application is very good. The purpose of technology expert validation is to ensure the accuracy, reliability, and credibility the mobile application. Technology experts play a crucial role in evaluating, verifying, and validating various aspects of technology-related projects. In terms of technology, this application achieved an average of 4.16 out of the total value scale of 5, which is equal to 83.20%. This shows that the developed mobile application is very good in rate. The application is effective and efficient in development and in use because was developed with newest technology in each tech-stack, has reliable apps architecture, can easily maintained and scalable for further development. The assessment from a design expert was carried out to determine the overall usability and design effectiveness of the application. In terms of design, this application achieved an average of 4.67 out of the total value scale of 5, equal to 93.33%. The user interface is considered highly attractive, featuring a well-suited color palette for the target users. The content layout within the application is precise and easy to read. The illustration style aligns with the target audience. Features in the application effectively cater to co-parenting needs. Clear icons contribute to user-friendly navigation, making commands and buttons easily readable. Overall, the application presents a seamless and user-friendly interface, ensuring ease of use and navigation. The results of parents responses is presented in Table 4.

Table 4. Results of Parent Responses

No	Assessment Aspect	Average Score	Percentage	Conclusion
1	Learnability	4.47	89.40	Very Good
2	Efficiency	4.29	85.80	Very Good
3	Memorability	4.14	82.80	Very Good
4	Error-Free	2.68	53.60	Good Enough
5	Satisfaction	4.17	83.40	Very Good
6	Content Quality	4.38	87.60	Very Good
7	Multi-Platform	4.25	85.00	Very Good
	Total	**28.38**	**567.60**	
	Average	**4.05**	**81.09**	**Very Good**

Base on Table 4, the asessment results from parents based on learnability achieved an average score of 4.47 on a scale of 5 with a percentage of 89.40. This result is included in very good category. The assessment of efficienty got an average score of 4.29 with an eligibility percentage of 85.80%, which is included in very good category. In terms of memorability, the mobile application achieved 4.14 out of 5, included in very good category too. The asssessment results on satisfaction, content quality, and multi-platform achieved an average score of 4.17, 4.38., and 4.25 respectively, with the eligiblity percentage of 83.40%, 87.60%, and 85%. The lowest average score was on error-free aspect. The asessment result of error-free aspect got an average score of 2.68 with the eligibility percentage of 53.60%. The average of parents response were 4.05 or 81.09% which is categorized as very good.

Discussion

The results of data analysis show that the mobile application entitled DUET-based co-parenting has very good qualifications, so it is suitable for use to increase children's motivation to achieve. The mobile application, DUET-based co-parenting, is suitable for increasing children's achievement motivation due to several factors. First, the mobile application entitled DUET-based co-parenting is suitable for use to increase children's achievement motivation due to its attractive appearance. Based on the expert validation results, the DUET-based co-parenting mobile application met the suitability criteria in terms of psychological content, application design, and technology/system used. The suitability of the media in terms of content or

design will make it easier for someone to use it (H. R. Pratiwi & Ismaniati, 2017; Yuniarni et al., 2020). Appropriate media will help optimally improve children's learning outcomes (Sri & Suyanta, 2019; Zaini & Dewi, 2017). The cover's attractiveness and the use of images and animations that suit the user's characteristics will attract children's attention (Munawaroh et al., 2020; H. R. Pratiwi & Ismaniati, 2017).This means that design experts have validated the DUET mobile app as worthy of use based on its design. This shows that in terms of appearance and design appeal, including the colors, images, fonts, and text size chosen in the application, it is in line with its objectives and makes it easier for users to understand the information conveyed (Anggraini & Sartono, 2019; Fathoni et al., 2020; Yuniarni et al., 2020).

Second, the mobile application entitled DUET-based co-parenting is suitable for use to increase children's achievement motivation because it makes it easier for parents to monitor children. Good qualifications must be distinct from the developed video meeting criteria, such as clarity of illustrative information. The content in the application is very helpful and beneficial for children if packaged attractively (Anggraini & Sartono, 2019; Fathoni et al., 2020). Parents understand the use of each article, video, and reflection in the application, making understanding the information or material presented easier. The high content quality score further strengthens the idea that the DUET mobile application can benefit users significantly. Parents are satisfied with the attractiveness, relevance of the material or content to their current conditions or needs, willingness to use the application, and tendency to recommend the DUET application to others. The results of the design expert validation highlight that every direction or instruction provided is easy for users to understand. In other words, the user interface, or UI, is what the user first encounters. Another way to define a user interface is the initial impression that users get (Watulingas, 2020; Wulandari & Ambara, 2021). Usability and other elements related to the user experience of a product are referred to as user experience or UX. When users feel uncomfortable using an app, website, or other digital product, their first thought will likely be "dissatisfied," If the user experience does not meet their expectations, they will likely leave.

Third, the mobile application entitled DUET-based co-parenting is suitable for use to increase children's achievement motivation because it increases positive interactions with children. This shows that the application content is excellent (Fathimah & Ishartiwi, 2018; Munawaroh et al., 2020; Yuniarni et al., 2020). In other words, application content, videos, and articles in the application help parents understand the concept of achievement motivation, increasing positive interactions with children and increasing children's discipline to increase achievement motivation. Additionally, in-app videos and articles help parents understand co-parenting and improve communication with partners to build effective co-parenting and increase their children's achievement motivation. Videos can increase motivation for achievement (Suryana & Hijriani, 2022; Swari & Ambarawa, 2022). These videos and articles also help parents improve conflict resolution to build effective co-parenting and increase their children's achievement motivation. Quizzes and questions in the application are helpful indicators of participants' understanding of the content of the articles and videos presented in each session. Reflection in each application session helps inform personal aspects important in understanding and absorbing content.

Previous research findings also reveal that digital media can facilitate early childhood learning (Aryani & Ambara, 2021; Sholikah et al., 2018). Other research also confirms that media developed according to needs can increase children's knowledge (Fitria & Juwita, 2018; Gusliati et al., 2019; Suryana & Hijriani, 2022). The score indicates that the development of the DUET mobile application aligns with the material content, essential complexity, indicators, and learning objectives. This alignment is supported by the assumption that the selection of learning materials must be relevant and interconnected with the achievement of competency standards, essential competencies, learning objectives, and the media used (Indah & Saleh, 2018; Trisnadi & Andayani, 2021). It can be concluded that the developed media has met the requirements for earning media. This aligns with the statement about making learning media, emphasizing two main principles: text and graphic design. The advantage of the developed media is that it involves using a writing style that is easy to read and understand. Apart from that, it emphasizes the use of a language style that is simple and easy to understand, using everyday language. This research implies that the mobile application entitled DUET-based co-parenting can increase children's motivation to achieve.

4. CONCLUSION

The development of the Coparenting Mobile Application is deemed "appropriate" for use as a learning tool on co-parenting and children's achievement motivation for parents. Content validation by psychology experts indicates alignment between basic competencies, indicators, and instructional content with the learning objectives. Design expert validation demonstrates the application of a learning approach in the product that can achieve the learning goals. Based on trial results, it is evident that the application is suitable and can be used effectively. The DUET mobile application is expected to be utilized in daily life by

parents, particularly in implementing co-parenting to collectively enhance children's achievement motivation.

5. ACKNOWLEDGE

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