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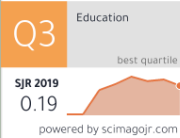
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The development of a digital application to promote parents' involvement in character education at primary schools

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Abstract. This paper documents the preliminary development procedure of a digital application named Parents UP to promote parents' involvement in their children character education at primary schools in Indonesia. Parents UP was developed as an android-based system interface and was proposed to enable parents maintain mutual engagement with school administrator, teacher and pedagogy team in nurturing and monitoring the good characters of the children. Despite the positive feedback from the school head-teachers, administrators, teachers and parents towards the incorporation of Parents UP technology in their children character education at school, some critical issues were highlighted during the pilot project, such as different focus of character education at the participating schools, diversity in parents' and students' economy and social status, and the influence of parents' culture and religion to the activity modules in the application. In reference to the findings, implications of the study to further development of Parents UP are offered.

Keywords: digital application, parents' involvement, character education, primary school education

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INTRODUCTION

Parental involvement and character education are regarded as important elements contributing to students' higher academic accomplishments, particularly in early stages of their education (Nokali, Bachman and Drzal, 2010). Moreover, the interaction of these two elements may benefit students' academic and social outcomes (Topor, Keane, Shelton and Calkins, 2010). Academically, Elias (2009) argues that parents' involvement in their children's education enables children to develop good manners during learning activities, which accordingly, may create a supportive learning atmosphere at school. Several studies also suggest that parental involvement in school education promotes positive effects on students' academic attainments, such as boosting students' performance and achievements, reducing truancy and juvenile delinquency (i.e. Kethineni, Kouassi, Columb and Gay, 2018; Park and Holloway, 2016).

Parents' involvement in school education activities may be either reactive or proactive (Olmstead, 2013). Reactive involvement in schooling includes parents' activities such as visiting the child's classroom, attending school functions, volunteering, and sharing experience in the class through guest speaking. Proactive activities include helping with homework, staying informed about school events, and monitoring a child's progress (Larocque, Kleiman and Darling, 2011). In daily education practices at school, these two methods of parents' involvement, i.e. reactive and proactive, should be used by schools to create mutual partnerships with parents.

This paper discusses our experience of developing a digital application called 'Parents UP' to enable parents to get involved in their children's character educational activities at primary schools in Indonesia. The following methodology and development narrative section describes the development procedure of the application. The application narrative section presents the application in the context, discussing the benefits and the challenges identified. Finally, the conclusion section summarises the study and offers alternatives for the improvement of the application.

LITERATURE REVIEW

From a social perspective, many studies (Chou, Yang, Hsin, Huang and Chen, 2014; Fan and Williams, 2010; Hilali and Rashidi, 2015; Hornby and Lafaele, 2011) have shown the benefits from parents' engagement with school educational activities on students' learning, affection and their social interaction. The studies found that parent involvement encourages students' social competencies in school, improving teacher morale and parents' confidence, strengthening the bond between parents and the students, instilling students' academic self-efficacy, enhancing students' intrinsic motivation to learn, retaining students' mental health, growing interest and satisfaction in their own education. Indeed, their involvement plays a significant role in disseminating and guiding the students to know, to care about and to act upon core ethical values in their daily life experiences. In other words, parents' engagement in school educational activities encourages higher levels of social development, maintaining students' good behaviour, which positively contributes to an effective education process, helping children in their social interactions within the community.

Ntekane (2018) views parents' involvement in education whereby parents are directly associated with their children's education, they commit themselves and are engaged by the school and teachers in the learning process. The involvement of parents in education represents their accomplishment of their duties as parents in assisting their children during the education process, learning as much as they possibly can. Such an assistance occurs within two key settings in the children's development, both at home and the school environment.

From an environmental framework perspective, Durisic and Bunievac (2017) characterise home and school settings as microsystems, with parent involvement conceived as a mesosystem, made up of interactions between key microsystems. Although, Durisic and Bunievac highlight that each setting can independently influence the learner, together the home and school settings interact to offer a unique influence. As a mesosystem, the involvement of parent in school educational activities bridges the interactional activities and children learning activities within the home setting. For instance, if parents are aware of a teacher's instructional aims, they may provide resources and support for those learning objectives at home.

Recent development of digital application in mobile devices has expanded the use of such devices other than for telephone calls, text messaging, and email (Hikmat and Mulyono, 2018). Within the educational context, mobile devices can be applied to support classroom teaching and learning (Baran, 2014; Price et al., 2014; Şad and Göktaş 2014; Seppälä and Alamäki, 2003; Serin, 2012). Furthermore, several authors propose that particular digital applications can help both schools and parents to monitor and enable their children succeed in the educational system (Chairatchatakul, Jantaburom, and Kanarkard, 2012; Patrikakou, 2016). Digital applications such as Moodle®, Skyward®, and PowerSchool® provide features that facilitate communication among teachers, parents, and guardians, more importantly features that help them monitor their children's learning progress. Using such applications, teachers, parents, and children receive information about upcoming events and assignments. Parents are also given access to monitor their children's attendance as well as their learning performance on tests and tasks. Although, it should be noted that the applications as mentioned earlier are limited as they support one-way communication: teacher- or school-to-parent.

Beecher, and Buzhardt (2016) developed the Family TIES app with the open-source PhoneGap® framework to facilitate partnership between teachers and parents. The educational features in the application allow teachers to create and adjust the existing curriculum, promoting effective and efficient communication as well as generating reports for parents to receive information about the school learning curriculum as well as their child's progress. Passey (2011) suggests that digital applications may enable a broader range of learning activities to be increasingly accessible at homes and other out-of-school locations (e.g., libraries, museums, youth centres), as well as in the schools themselves. With the tools, children's activities in school can often now be accessed by their parents and guardians, enabling work items to be announced or completed in homes or in other locations.

METHODS

System overview and development

Parents UP is a digital android-based application to provide a system interface that allows engagement between teachers and parents in character education at school. The Parents UP application was proposed in response to the Indonesian government “strengthening character education at school (STCS)” initiative and funded by the research and development body of the University of Muhammadiyah Prof. DR. HAMKA, Jakarta, Indonesia. In this paper, the term character education was operationalised as educational activities promoted to help students to learn about good characters, value them, and act upon them within or outside the school community (Lickona, Schaps, & Lewis, 2002).

Parents UP application adopts a-client-server model to enable an inter-communication process between the clients and server (Kratky & Reichenberger, 2013; Kumbhar, Wanjara, Trivedi, Khairatkar, & Sharma, 2014; Oluwatosin, 2014). To develop such a model, the MySQL server was utilised as the server database, Apache server, PHP 5.5 module, an Android Apps Native with an Application Programming Interface (API) for the development tools. Kumbhar et al (2014) reported that the use of MySQL is easy and efficient as it enables the application to store a large number of records and requires less configuration. They also suggest that the Apache server is free and can be deployed at ease. Parents UP activities were structured and presented in Figure 1 below:

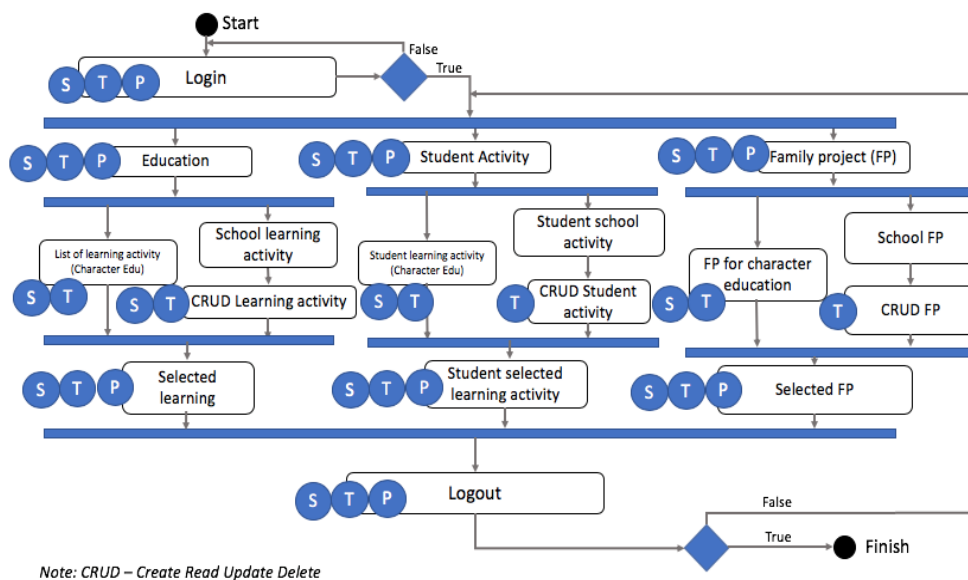


Figure 1. Parents UP structure

- (S) = School administrator & teacher menu
- (T) = Pedagogy team menu
- (P) = Parents menu

Parents UP provided three main roles: school administrator (S₁), teacher (S₂), pedagogy team (T) and parents as main educators (P). Specifically, the pedagogy team is a group of experts that help schools improve the quality of education. The team comprised three experts from a graduate school of a private university in Jakarta. The team was assigned to develop character education modules that can be accessed by parents through the application. To use the application, school administrators, teachers, pedagogy team and parents (later mentioned as users) are required to install the application from the Google Play Store. Alternatively, users can install the respective apk files onto their android devices. Every user is given a unique ID to log into the Parents UP application.

Module development for character education at school

Parents UP modules refer to the parenting activity that parents would carry out when using the application. The development of Parents UP application modules addressed five domains of good characters as suggested by the ministry of education and culture (MoEC) Republic of Indonesia (2018; 2010), including religious, nationalism, independent, collaboration, and integrity (Table 1).

Table 1. Five good character education

No	Domain	Good characters
1	Religious	Peace, tolerant, respect to diversity, honest, confident, fair, protect the weak
2	Nationalism	Respect owned culture, loyal, superior, high-achieve, law-obedient, discipline respect to diversity
3	Independent	Hard-working, tough, commitment, creative, brave, lifelong learner
4	Working together	Respectful, work together, inclusive, solidarity, empathy, anti-discrimination, anti-violence, sincere
5	Integrity	Honest, commitment to justice, moral commitment, justice, responsible, role model, respect others in the community

The five domains were deployed in Parents UP application modules represented by six main features including education (EDUKASI), student activity (AKTIVITAS ANANDA), family project (PROYEK KELUARGA), parents' note (CATATAN AYAH BUNDA), gallery (GALERI), and forum (FORUM) as shown in Figure 2. The design of such features were particularly to address the challenges encountered by parenting programmes in Indonesia as reported in Tomlinson and Andina (2015).

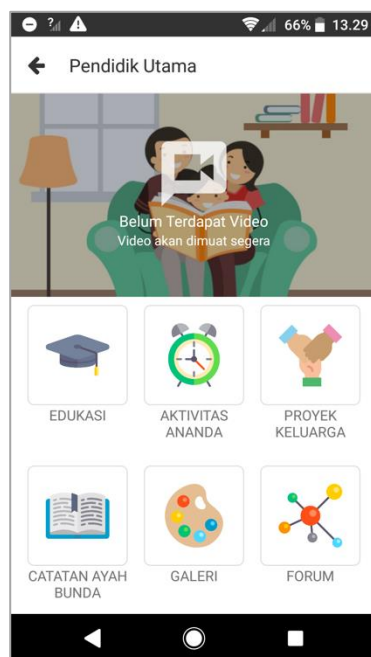


Figure 2. Parents UP modules

The education feature aimed to provide information about parenting, particularly how to nurture good characters in their children. Student activity features a list of daily activities that may promote good character. In this feature, parents are asked to monitor their children's activity and complete a check-list observation sheet in the application. The family project lists some activities that should be done by student and his/her parents, student with his/her mother, and student with his/her father. The focus of this feature was to create a bond among the family members, for example, reading a book together at bedtime or having dinner together.

In addition, parents' note offers an opportunity for parents to record and evaluate critical events. This activity was particularly aimed at encouraging parents to monitor their children's activities and critically evaluate the benefits and challenges from such activities. This critical evaluation helps parent in making judgements regarding their children or give them advice.

The gallery features a collection of videos and images showing the parental activities at home. In this feature, parents are encouraged to upload videos or images for reflection of their parenting activities. The other feature facilitates interactions among school administrators, pedagogy team and parents. This interactive feature enables the pedagogy team to help parents overcome potential challenges encountered during parenting activities at home. The feature also allows school administrators and teachers to communicate the children's performance at school to their parents.

RESULTS AND DISCUSSION

The Parents UP application was introduced and piloted at four primary schools in Jakarta and Depok, West Java, Indonesia. Prior to the pilot, we introduced the application to school management and asked for consent to pilot the application. The pilot project of Parents UP application at four primary schools i.e. School A, B, C and D involved three main activities: seminar to introduce Parents UP, training in the use of the application and the use of Parents UP. The seminar ran for about one hour with a total of sixteen participants representing head-teachers, administrators, teachers and parents (see Table 2).

Table 2. *Participants (labelled with capital letters) in the Parents UP seminar*

Role/School	School A	School B	School C	School D
Head-teacher (HT)	HTA	HTB	HTC	HTD
School administrator (SA)	SCA	SCB	SCC	SCD
Teacher (T)	TA	TB	TC	TD
Parents (P)	PA	PB	PC	PD

In the seminar, an author informed all the stakeholders about the purpose of the Parents UP application, the module syllabus, the features, the activity and the benefits of using the application. Short training sessions were also conducted to inform end-users on how to operate the Parents UP application. The training aimed to help familiarise them with the educational technology that they would use, to enable participants use the application and to address potential technical issues during the operation (Mulyono, 2016). The training covered two sessions of 90 minute-duration and a total of fifteen school administrators and five parents attended the training.

To examine the potential benefits of the application, we conducted observation and surveyed the end-users of the application during the pilot project. We observed the practice of the school administrator and parents when using Parents UP. We recorded written notes on particular events that we thought necessary and critical. Such observation enabled us to obtain a holistic view of the character education practices, thus helping to comprehend the education events within a realistic digital environment (Hikmat & Mulyono, 2018; Martinez, Taut, & Schaaf, 2016; Solihati & Mulyono, 2017). The school administrators and parents found no difficulty in operating the Parents UP application, and the application was regarded as easy to use. The icon menus presented in the application screen were clear enough to see and with soft colours comfortable on the eyes. Critical questions from the end-users were related to blank content that had not yet been uploaded.

We also conducted a focus group with four school head-teachers, four school administrators, four teachers and four parents to clarify the information obtained from the observations. During this discussion, the participants were asked to present their views concerning the Parents UP application and potential contributions to school character education to identify the benefits and challenges that end-users encountered when operating the Parents UP application.

From the discussion, all end-users of Parents UP application perceived the application as an alternative technological tool that helped teachers and parents to maintain the nurture of good characters of their children. This finding concurs with several studies (Beecher, C; Buzhardt et al., 2016; Olmstead, 2013), suggesting that teachers and parents believed technology is an effective media to enhance parents involvement in their children's education. All school head-teachers and teachers asserted that parents' engagement in their children's character education enabled schools to achieve the objectives of their curriculum character education. Similarly, Berkowitz and Bier (2005) asserted that parents involvement is a key to effective character education.

Despite the positive feedback from the school head-teachers, administrators, teachers and parents, some critical issues were highlighted during the pilot project, including the different focus of character education at the participating schools, diversity in parents' and students' economy and social status, as well as the influence of parents' culture and religion to the activity modules in the application. As Patrikakou (2016) contended, schools should ensure that the use of technology will not discriminate parents who have limited access to technology for whatever reason, such as socioeconomic status.

One of critical challenges that we observed was concerned with activity assessment and report. Although parents were well informed about the purpose of the Parents UP application, parents were still unclear if their activities in Parents UP were assessed by the school. Parents also considered that many of the materials presented in the education module were too religious and might be of interests of those Moslem family. In many tasks, the application required parents to control their children's prayer time or asked parents to observe if children greeted their parents in an appropriate Islamic manner; two Muslim parents regarded such activities as a burden. Moreover, one of the parents suggested that religious practices were private domains that the schools should stay away from. The feedback was useful for the content developers of the application to consider the types of tasks and parents' workloads so as to modify the material regarding parents' beliefs and religion.

CONCLUSIONS

This paper has presented a narrative regarding the software development of the Parents UP application as an alternative tool to enable parents' engagement in their children's character education at school. The response of the Parents UP application end-users during the pilot project was positive. Nonetheless, critical challenges of the application were identified, so further development of the application is required to address these issues to further improve the effectiveness of the Parents UP application.

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