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Effectiveness of Systematic Procedures for Parents' Involvement in Interactive Science Homework

Salbihana Samsudin[1], Lilia Halim[2], Wan Nor Fadzilah Wan Husin[3] & Nurazidawati Mohamad Arsad[2,*]

[1]Planning, Research and Innovation Department, IPG Kampus Tun Hussein Onn

[2]Faculty of Education, Universiti Kebangsaan Malaysia

[3]Curriculum Development Division, Ministry of Education

[*]Corresponding author: Faculty of Education, Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia. Tel: 60-3-8921-6237

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Abstract

Home-based Teaching and Learning (PdPR) is an alternative learning approach in many countries, including Malaysia, and is in line with the new normal. It emphasizes parental roles in helping children learn effectively at home. This study aims to examine the effectiveness of parental involvement through a systematic procedure in the implementation of Interactive Science Homework (KRIS). Using a Quasi-Experimental design, this study involved a total of 69 Year Three elementary school children with their parents. Children in the treatment group (n=37) underwent the KRIS intervention with homework systematic completion procedures. Meanwhile, children in the control group (n=32) underwent a KRIS intervention without the systematic procedures. Data were collected through the review of returned assignments from both groups. Semi-structured interviews were also conducted with the children's parents. The data from the returned assignments and records of the children and parents' involvement were analyzed using descriptive analyses. The interview transcripts were analyzed thematically. The findings show that assigning KRIS with systematic procedures has a positive effect on the children, where the assignment return rate and parents' involvement were higher compared with the intervention without systematic procedures. In this light, parents have the opportunity to guide their children in learning more systematically and are able to keep track of their children's performance in school. The main implication of this study is that the development of guidelines for parental involvement in the science curriculum will encourage the children to learn science together with their parents.

Keywords: interactive homework, parental involvement, primary students, science process skills

1. Introduction

The education sector is one of the significantly affected sectors as the world faces a new normal due to the Covid-19 pandemic. Although children were unable to attend school due to forced school closures, they have the right to learn through the implementation of Home-based Teaching and Learning (PdPR), as postulated by the Ministry of Education Malaysia (MOE). PdPR entails that the teaching and learning process is carried out remotely, either at home, community centers, or any suitable location. PdPR could be implemented online, offline, or off-site in a structured and planned manner (MOE, 2021). However, this alternative approach has its challenges. In online learning, children frequently experience issues such as lack of internet connection at home and disruptions to internet access (Hamdan & Muhamad, 2021). Therefore, science homework is recommended during PdPR. However, the main constraints are in providing hands-on learning and facilitation (PdPc) as well as the direction that children are required to learn at home in the same manner as they do in the classroom. As a result, this issue must be addressed appropriately.

Not all curriculum content can be taught online/offline through remote teaching. Indeed, several studies have identified conclusively that online learning is inferior to face-to-face learning (Thai et al., 2020). For instance, in the Science subjects, PdPc should involve hands-on activities to help children master the knowledge and demonstrate the mastery of science process skills. In this sense, the learning process requires children to construct concepts actively as they learn through hands-on activities (Choirunnisa et al., 2018). However, virtual learning through interactive multimedia technology only allows materials in the forms of text, voice, graphics, video, and music to be presented virtually (Chuang & Cheng, 2005). Nevertheless, children knowledge will grow over time as they gain experience (Mahad et al., 2020). This situation raises concerns as hands-on PdPc activities related to science processes could not be conducted virtually. The lack of face-to-face interactions will hinder children understanding of science concepts. This is likely to occur as instructions related to science processes such as observing, predicting, and investigating could not be carried out using proper scientific methods (Osman, 2012).

During PdPc in the classroom, teachers will guide children to ensure that the learning process aligns with the learning goals and objectives that have been set in the standard document used in schools. On the other hand, when learning takes place outside the classroom (without the presence of a teacher), guidance from other individuals such as mentors are essential in ensuring that the learning goals and objectives are in line with established guidelines. According to Vygotsky's Scaffolding Theory (Margolis, 2020), individuals capable of supporting children learning include parents, teachers, friends, or tutors. These individuals play the role of more knowledgeable persons that could help and support the children knowledge development. They provide a supportive structure to help the children reach a specific target or goal. In the context of PdPr, where the learning process takes place at home, parents are the most suitable and capable to take on this role.

Studies conducted over the years have shown that parental involvement could positively impact children development and achievement in school (Gonida & Cortina, 2014; Kim,

2020). For example, a study by Dettmers et al. (2019) found that the quality of parental involvement has a greater influence on children achievement than the quantity of involvement. Parents' attitude towards science is one of the issues discussed in the TIMSS 2015 (Martin et al., 2016). Based on the report, parents can help children achieve more by providing access to learning resources and spending more time with their children to do literacy and numeracy related activities. According to Hafidz et al. (2020), family-based online learning innovation or home education is a new type of learning activity designed for educators and is different from the typical practice. It is aimed at assisting children in acquiring knowledge by involving families in the process of positive behaviour change. In relation to the teaching and learning processes in non-formal education, family-based learning innovation refers to a program developed in an attempt to solve problems by fostering cooperation between schools and families, such that the learning process that occurs at school is also supported and understood by the family.

In our education system, homework has long been used as an intermediary platform to provide parents with the opportunity to help their children learn. Studies have also shown the positive effects of well-planned homework and providing clear guidance for parents (Van Voorhis, 2003). These findings supported a previous study by Corno (1996) where parental involvement in completing children' homework could have a negative impact if not implemented properly, as expected by teachers and policymakers.

A study by Cooper et al. (2000) raised concerns as it was reported that two-thirds of parents provided the wrong form of assistance or support for their children homework. Parents have reported that they use shortcuts to help their children complete the homework more quickly, such as completing the homework on behalf of their children, and explaining the task based on their understanding, which result in the children finding their homework to be more difficult. Therefore, teachers need to ensure that children complete their homework in accordance with the policies and requirements of the curriculum. In this regard, there is a need to emphasize the teacher's role in providing guidelines to ensure the successful completion of homework and parents should be made aware that their involvement can positively impact their children learning.

The MOE has launched the Parent Toolkit and School Toolkit as part of the parents, community, and private sector initiatives under the Malaysia Education Development Plan 2011-2025. These toolkits serve as basic guidelines for their engagement and involvement in their children learning. The parent toolkit contains information on the importance of parental involvement in supporting learning, a self-assessment on parental involvement, a guide in preparing a home learning environment, interacting socially, and providing support to children as well as some examples of best practices for parents' reference. In addition, their roles as coaches, mentors, supporters, life planners, and friends to teenagers are also included as further information. However, it is important to note that the toolkit only provides general guidelines for parents' involvement. Thus, teachers are responsible in preparing a more specific guideline to help children complete the tasks and assignments given based on the existing curriculum guidelines and ensure parents can provide optimal support to achieve the desired goal.

Taking the example of Singapore as one of the top-ranking countries in TIMSS achievement, the importance of parental involvement in supporting the formal education system in schools has long been recognized. Accordingly, the Singaporean Ministry of Education also developed a guideline for parents, entitled 'Primary Science Parents' Guide' in line with the Singapore Primary Science Curriculum to provide specific guidelines for parents in supporting their children learning at home and in other informal environments (Lee, 2012).

Home-based virtual learning during the implementation of PdPr has limited teacher-guided hands-on learning in the science subject in contrast to conventional teaching practices. Therefore, support from individuals who can take on the same role as teachers in school should be considered. Hence, parents' involvement is much needed to ensure the successful completion of tasks assigned as homework. However, several constraints occurred during the implementation phase of PdPR which affected elementary school children who require continuous guidance during home-based learning sessions (Saifudin & Hamzah, 2021). Many parents are aware of the importance of their involvement. However, they do not know how to support their children learning. In light of the PdPR implementation during the Movement Control Order (PKP), this issue needs to be addressed in order for parental involvement in their children learning at home to be appropriately done to positively impact the learning of science in primary children.

Therefore, this study aims to examine the effectiveness of systematic procedures in the implementation of interactive science homework (KRIS) with parental involvement.

2. Interactive Science Homework (KRIS)

Homework comprises any tasks related to the content of the lesson assigned by the teacher to the student (Abdullah, 2004). Cooper (2007) described homework as tasks that should be done outside the classroom, and their contents should be related to the school curriculum as structured by teachers. Idris et al. (2014), in a review pertaining to homework implementation policy, discussed some issues that need to be considered regarding the use of appropriate materials for homework activities and assignments given to children. Teachers need to take into consideration that the time, monetary support, or commitment required should not burden the children and their parents. Apart from that, the homework assignment policy needs to consider the need to explicitly state the type of support needed. Therefore, this study suggests interactive science homework (KRIS). The conceptual framework of this study is as shown in Figure 1.

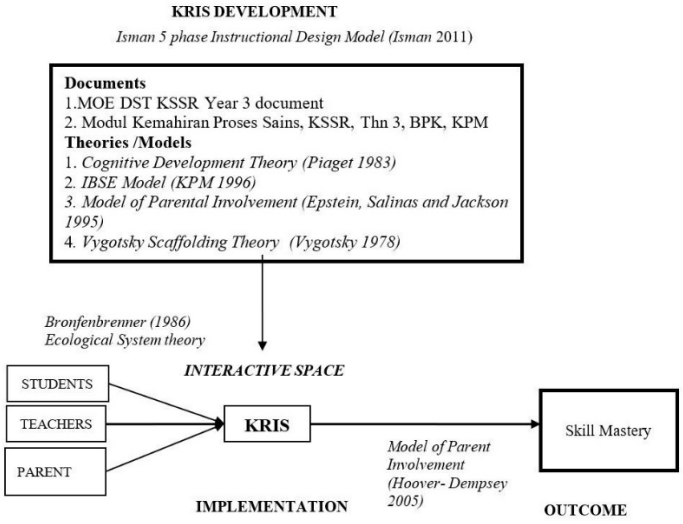

Figure 1. Conceptual Framework

1.1 Development Phase

Science Interactive Homework (KRIS) was constructed based on several documents. These documents are the Year 3 Primary School Standard Curriculum (KSSR) for the Science and Technology World (DST) subject and the Year 3 KSSR Science Process Skills Module, Year 3 published by the Curriculum Development Centre, MOE. The homework tasks were also designed based on theories/models related to the KRIS implementation procedures.

KRIS was developed upon consideration of several related theories and models. The first theory involved in the conceptual framework is Piaget's Theory of Cognitive Development which explains the importance of activities using existing materials and performing hands-on activities. This theory emphasizes cognitive development according to children age. For example, children at the age of nine are in the Concrete Operational developmental stage. Piaget outlined several suggestions that can help children learn during the Concrete Operational stage. These include implementing hands-on activities using authentic materials (everyday/concrete objects), providing examples related to daily life, carrying out learning according to a hierarchy (increasing level of difficulty), and problem solving that requires analytical, logical thinking.

Considering Piaget's Theory of Cognitive Development, this study proposed the implementation of hands-on activities for children in Year Three elementary school, who are nine years old. Children need to experience a process of exploration involving basic scientific skills. This is because learning through actual experience can help children learn optimally (Choirunnisa et al., 2018). The implementation of KRIS is also an effort to ensure that each student will experience observation activities. Implementing KRIS at home requires children to do individual activities rather than in groups, such as the experimental activities conducted in schools. According to Osman (2012), science process skills form the basis of the inquiry process and engaging in the inquiry process will help children understand and acquire scientific knowledge and skills. Children typically engage in an inductive or deductive

self-learning process in this process as they investigate the relationship between the dependent and independent variables through experiments (Wilhem & Beisuizen, 2003).

The first step to immerse the children in the inquiry-based learning process is by exposing them to situations closest to their real lives. Therefore, the observation process in KRIS was set to involve objects found in the home environment. Observation activities and tasks designed in KRIS involve all five senses (sight, hearing, smell, taste, and touch). Apart from considering the suitability of the materials used to engage all the senses as the children make observations, readily available authentic materials are also beneficial in teaching children about the application of science in everyday life. Children will gain meaningful experiences as they engage in activities that involve objects they can find in the daily environment.

Based on Piaget's theory, children need to play an active role in the learning process by behaving like scientists in conducting experiments and making observations about the world around them. Children will acquire new knowledge as they interact with the world around them, and at the same time, they will adapt initial (existing) ideas to build new ones. Hence, PdPc that is related to children' real-life environment can positively impact the development of science process skills among them (Rian & Osman, 2011).

Teaching materials are prepared according to the IBSE Model (Inquiry-Based Science Education) to encourage the implementation of hands-on activities through the inquiry approach. According to Shamsudin et al. (2012), there are three mediums under the IBSE Model approach involved in science PdPc, namely inquiry, discovery, and experience. Children are engaged in investigating problems, seeking knowledge that requires critical thinking, making observations, answering questions, conducting experiments, making conclusions, and thinking creatively (Hiang, 2005). Studies show that these inquiry skills play a role in determining children achievement in science. Since 1996, the MOE has exposed science teachers to IBSE and encouraged its implementation in science PdPc (Sikas, 2017). The importance of implementing inquiry-based teaching was also a part of the PISA assessments. The competency domains measured comprise a combination of scientific knowledge and an individual's attitude, which requires inquiry skills that are important elements in developing thinking and science process skills.

Another theory supporting the development of KRIS is Vygotsky's Scaffolding Theory. The application of this theory focuses on the need for more knowledgeable individuals to guide children in doing their homework, which is closely linked to parental roles. As concluded in a study by Weiss et al. (2005), parental involvement plays a key role in determining children success in school. This is because parents are the closest individuals who share the same life experience with the children. Furthermore, as most children live with their parents, they could guide their children to become more observant individuals, which is important for their intellectual development (Tizard & Hughes, 2002). As a result of their development and the experience of getting a positive response from someone older during the learning process, the children will gradually become inquisitive and develop the ability to connect relevant scientific information with what they are learning (Vandermaas-Peeler et al., 2018).

The Epstein Model of Parental Involvement (Epstein et al., 1995) is the underpinning model

behind the development of KRIS, specifically in terms of parental involvement in helping children learn. This model outlines six forms of involvement that could have a positive impact on a student's achievement in school, namely (i) parenting, (ii) communication, (iii) volunteerism, (iv) learning at home, (v) decision making, and (vi) collaboration with the community. The implementation of KRIS has considered four out of the six forms of parental involvement.

Table 1. Parents' Involvement in KRIS Implementation Procedure

No.	Form of involvement	Description	KRIS Systematic Implementation Procedure
1	Parenting	• Provide parents with parenting skills. • Create a learning environment at home.	Notice to parents
2	Communication	• Provide two-way communication between the school and the parents.	Confirmation of involvement
3	Volunteerism	• Improve recruitment, training, activities, and schedules to involve parents	Interactive space
4	Home learning	• Provide activities for families and children at home, including homework, setting goals and related curriculum activities. • Encourage teachers to prepare homework that allows students to share and discuss the assigned tasks.	Scheduled homework implementation period.

Table 1 shows four of the six forms of parental involvement according to the Epstein Model of Parental Involvement (Epstein et al., 1995). The implementation of KRIS touched on four forms of involvement outlined, which are (i) parenting, (ii) communication, (iii) volunteering, and (iv) home study. These four forms of involvement are the basis of KRIS implementation; hence, translated in this study as the KRIS implementation procedures. This study's consideration of involving parents in homework implementation is also based on past studies that found children expect help from parents in completing their homework (Turanli, 2009). Studies in Malaysia have shown that parents have largely been involved in helping children complete their homework; it was reported that parents agreed that they could provide better help if teachers provided them with the means to do so (Mahmud & Haron, 2017).

1.2 Implementation Phase

This phase links to the theory that underpins the implementation of interactive homework. The KRIS implementation is underpinned by Bronfenbrenner's (1986) Ecological Systems Theory. The theory states that a child's development is strongly influenced by the subject (themselves) and the structure of the environment closest to them. In the context of learning in an informal setting (at home) as a complement to formal learning (in the classroom), the

two environmental structures involved in this study are (i) classroom and (ii) family. In this study, the children are the subjects. Teachers represent the classroom environment structure, while the parents represent the family environment structure. Bronfenbrenner's Theory of Ecological Systems asserts that positive interactions between teachers, parents, and children will balance children development and learning.

In this study, the effect of supervised interaction between parents and their children is referred to as the experience of receiving a positive reaction from someone older during the learning process. In addition to the impact of parental involvement on children' achievement, parents will also reap benefits from such interaction. This is because the experience allows them to understand school-related principles regarding parental involvement (Epstein, 1986). The KRIS implementation component also describes the impact of environmental influences on children development. In conclusion, the interactive space provided is intended to present the opportunity and guideline on how homework could be completed according to the procedures and assignment of hands-on tasks to facilitate good communication between parents, children, and teachers. Other than that, parents are given the opportunity to be part of their children's science learning at home. The interaction between the three subjects (teachers, children, and parents) resulting from the KRIS implementation in this study is expected to occur explicitly and actively in the interactive space, which ensures that parental involvement can provide optimal impact in supporting children' learning. Nevertheless, the relationship between teachers, children, and parents remains a strength that has yet to be optimally utilized (Fullan, 2007).

In the context of this study, the KRIS implementation process involves interactive and collaborative elements between teachers, children, and parents. Teachers play a role as more knowledgeable individuals (content and curriculum) in the school. Meanwhile, parents play a role as more knowledgeable individuals in helping children complete their homework based on the procedures given as a guideline. Considering the challenges faced by parents who need guidance to support their children learning, the KRIS implementation includes a set of procedures that need to be followed to maximize the impact of parental involvement. These procedures comprise information, guidelines, and notes that parents can refer to in helping their children complete the assigned homework.

The interaction space provided in the implementation component allows interaction between teachers, parents, children, and materials. This is in line with the definition of inquiry related to the nature of teaching and learning. Such definition is in line with Piaget's idea of conceptualization, knowledge construction, and the role of experience. It also advocates Vygotsky's meaning of learning in social terms and reference (which in this study refers to parents) and method of scientific thinking where understanding and reasoning are vital elements in the process (Constantinou et al., 2018).

1.3 Outcome Phase

The next phase is the outcome or achievement phase, which reflects how parental involvement impacts student achievement. The achievement component in the study's conceptual framework highlights the factors contributing to parental involvement and the

impact of parental involvement in helping children learn. For this purpose, the study refers to the Hoover-Dempsey Model of Parental Involvement (Hoover-Dempsey & Sandler, 2005).

The Hoover-Dempsey Model of Parental Involvement describes three factors that contribute to parental involvement, namely (i) parental motivational beliefs, (ii) parental perceptions of 'invitations' of involvement from various parties, and (iii) parental perceptions of life context. In this study, all three factors had been considered in finding the space and determining the parental involvement procedure in helping children master the most basic science process skills, specifically observation process skills. The first factor is the belief in parental motivation or readiness in this study's context. This factor is further divided into two aspects, (i) responsibility and (ii) ability.

The second factor is parents' perception of the 'invitation' to be involved. This involves three parties, namely (i) the school, (ii) the student, and (iii) the teacher. Here, invitation refers to the explicit invitation stated in the KRIS implementation procedure for parents' involvement. Parents of children in the treatment group received an invitation from the school through briefings and notification letters. Furthermore, their involvement was emphasized through procedures asking children to involve their parents in completing KRIS, sending invitations through the parent/parent feedback space, and providing the teachers' contact information if they face problems while helping their children.

The third factor in this model is the perceived context of life that involves aspects of parents' knowledge and their time. Thus, in this study, the context of parental life was reflected through their education level and working hours. This is in line with Walker et al. (2005) who found that personal factors, such as educational level and working time, influenced parents' involvement in their children learning. Therefore, the aspect of education level was considered in the implementation of KRIS, where guidance notes for parents are provided to support parents who are less confident in helping their children learn. Besides that, working hours were considered in the KRIS implementation procedure by not assigning homework on weekends to give them the space to complete KRIS.

Overall, this study's framework involves theories and models that demonstrate the importance of interactions between teachers, children, and parents in completing the homework assigned in an informal environment to help children master observation skills. Apart from that, the research framework also reveals the challenges and limitations that need to be considered in implementing KRIS.

1.4 Interactive Science Homework Completion Guideline

This study has proposed a procedure as a guideline for homework completion with parental involvement. It has considered the positive effects of parental involvement in helping children learn science based on theories and models as well as the challenges faced by parents in assisting children to complete their homework. The following guidelines were developed based on TIPS (Teachers Involve Parents in Schoolwork):

1. Learning objectives/goals are explained to parents.

2. Materials/tools used are inexpensive and easily available at home (or supplied by teachers).

3. Descriptions and implementation guidelines are carefully communicated to children.

4. The homework assigned involves two-way communication (children and teachers/children and parents/teachers and parents).

5. Parents are provided with time and space to help their children complete the assigned tasks.

The homework completion guidelines also considered the procedures used by Epstein et al. (1995). These procedures present the following technical steps that need to be implemented in support of the set conditions:

1. Hold a meeting and distribute a Notification Letter to parents (which includes a detailed explanation of the activities required, including the time allocated for completion).

2. Provide the teacher's telephone number for parents to contact if they are having problems regarding the homework.

3. Obtain confirmation of tasks completion from parents.

4. Distribute notes and guidelines related to the science homework to parents.

5. Allocate time, i.e., one week (preferably over the weekend), for children to complete and submit their homework.

6. Provide an interactive feedback Space to enable parents to give opinions on the implementation of the related homework.

2. Method

This study used the quasi-experimental nonequivalent control group design. A total of 69 Year Three elementary school children and their parents were divided into treatment and control groups. Both groups were assigned with interactive science homework (KRIS). The children in the treatment group were assigned with a set of systematic procedures for KRIS. In contrast, the children in the control group were given KRIS with a common method without any procedures. The interventions were implemented four times with a one-week time interval between interventions. The study aimed to examine the effectiveness of KRIS (with or without systematic procedures) based on a document review (homework submission and parent involvement) and semi-structured interviews related to the implementation of KRIS. The document review involved data from both groups, while the interviews only involved parents from the treatment group completing the homework assigned with the systematic procedures. Findings from the quantitative and qualitative components were combined to produce a comprehensive, in-depth summary of the intervention effectiveness. Since this study involved pupils and parents with diverse backgrounds, the data of this study can only be generalized to the groups of pupils and parents with backgrounds similar to the participants involved in this study. However, the findings are meaningful in giving an insight

into the real scenario of parental involvement in pupils' homework.

3. Results

The findings of this study were divided into: (i) document analysis of the homework submission record and parental involvement record in both groups, and (ii) analysis of transcripts of interviews involving parents of children in the treatment group.

3.1 Homework Submission Record

Table 2. Table Title (This is an Example of Table 1)

Intervention	Status	Treatment group N (%)	Control group N (%)
Homework I	On- time	37 (100.00)	30 (93.75)
	Late	0	0
	Not submitted	0	2 (6.25)
Homework II	On-time	34 (91.89)	28 (87.50)
	Late	3 (8.11)	0
	Not submitted	0	4 (12.50)
Homework III	On-time	32 (86.49)	27 (84.38)
	Late	5 (13.51)	1 (3.12)
	Not submitted	0	4 (12.50)
Homework IV	On- time	32 (86.49)	24 (75.00)
	Late	5 (13.51)	3 (9.38)
	Not submitted	0	5 (15.60)

As shown in Table 2, the number and percentage of homework submission are higher for children in the treatment group than children in the control group. It could be observed that none of the children in the treatment group did not submit their homework, while the number and percentage of children in the control group who did not return the assignments increased.

3.2 Pupils and Parent Involvement Record

Table 3 presents the number and percentage of parental involvement in the homework completion interventions for children in the treatment and control groups based on the feedback forms. It was found that children in the treatment group went through the four interventions with their parents. Meanwhile, not all children from the control group performed the tasks with their parents. Over 40% of the children completed the homework on their own. However, the findings indicated that parents from the control group are willing to be involved in helping their children even if they did not undergo the procedure (such as in the treatment group). This study also found that the mothers are more involved than fathers in each intervention conducted.

Table 3. Parental Involvement in Homework Implementation

Involvement	Homework I		Homework II		Homework III		Homework IV	
	T	C	T	C	T	C	T	C
				n (%)				
Self	0	14 (43.7)	0	14 (43.7)	0	13 (40.6)	0	13 (40.6)
Mother	28 (75.7)	13 (40.6)	28 (75.7)	13 (40.6)	28 (75.7)	12 (37.5)	28 (75.7)	11 (34.4)
Father	7 (18.9)	2 (6.3)	7 (18.9)	0	7 (18.9)	1 (3.1)	7 (18.9)	2 (6.3)
Both parents	0	0	0	1 (3.1)	0	2 (6.3)	0	1 (3.1)
Others	2 (5.4)	1 (3.1)	2 (5.4)	0	2 (5.4)	0	2 (5.4)	0
Not Submitted	0	2 (6.3)	0	4 (12.5)	0	4 (12.5)	0	5 (15.6)
Total	37	32	37	32	37	32	37	32

T = Treatment Group; C = Control Group

3.3 Parental Feedback Related to the Implementation of Science Interactive Homework with Procedures

A series of structured open-ended interviews were conducted with parents in the treatment group, where interactive science homework was assigned with procedures. The parents provided positive views on the implementation of the procedures.

One of the parents commented that providing these procedures help working parents to be engaged in their children learning.

“Maybe most parents are busy, maybe they don’t have time… if there are activities at school, only half can come. So, with the science homework at home, we can help, maybe not even full time, but there are times when we can pay attention to homework.” (Respondent 08)

Furthermore, several parents praised the effort to provide guidance notes to parents as a reference for their involvement in helping children complete the homework, which is one of the procedures in the assignment of interactive science homework in the treatment group.

“There must be an example like this… so we know how to answer there.” (Respondent 06)

“There must be something like this. There are homework that needs to have guidelines for parents. So, from there indirectly, parents get information and can help children. As far as homework concerned, I made a promise… we can’t see.” (Respondent 04)

The implementation of this procedure has also encouraged children to invite their parents to do homework together.

"In the past, he never asked us and we never knew what he studied at school, but with homework like this, he asked us to do it together, so we know what he has learned. Fortunately, there is a note that we can refer to." (Respondent 01)

The parents also noted that assigning the science interactive homework with procedures can help parents keep track of their children's lessons in school.

"We are not highly educated, we've been in school for a long time… so I don't know what my children are learning… it's not the same as our time before… so with this homework we get information." (Respondent 02)

4. Discussion

Based on the findings, the implementation of Interactive Science Homework (KRIS) with a set of systematic procedures has a positive impact on children homework completion and increases parental involvement in completing the assigned homework. This proves the importance of considering children cognitive and psychological development based on Vygotsky's Scaffolding Theory. In this regard, parents' involvement in helping children learn at home through the KRIS implementation during PKP not only ensures that children can properly perform hands-on activities but also increase the homework submission rate. Although there were still children who submitted late, all children in the treatment (those who went through the procedures) successfully submitted their homework. The findings also proved that the implementation of the systematic procedures increased parental involvement. This suggests that parents are willing to assist their children in learning science (Hoover-Dempsey et al., 1995) and are willing to support homework completion (Glasgow & Whitney 2009). Besides that, children are able to master science process skills in completing their homework even though they cannot attend school and perform hands-on activities with their teachers.

Further to that, this study found that the existing practice of encouraging children to involve their parents in guiding their homework without any explicit support procedures (such as instructions and parents' notice) cannot ensure parents' compliance and commitment to help their children. This is evident in the finding where less than 40% of the children in the control group completed their homework without any parental involvement during the intervention.

Based on the interviews conducted, it can be concluded that parents have positive feedback on the assignment of the interactive science homework. This shows that some parents are already involved in helping children with their homework, and they could provide better help if the teacher provides them with the needed guidance (Mahmud & Haron, 2017). The findings from this study indicated that parents agree with assigning interactive science homework with procedures due to these reasons:

• It provides opportunities for parents to help their children learn more systematically.

• It provides notes as guidance for parents to help their children.

• It encourages children to invite their parents to do the homework together.

• It helps parents track what their child is learning at school.

The initiative to provide guidance notes for parents could help provide support for them during the implementation of student homework in line with the learning objectives based on the curriculum. This effort also has a positive impact on parental involvement. This study found that providing parents with information/notes related to the homework could guide them to engage in their children learning in the right way.

Distributing guidance notes to parents has been found to rectify the issue regarding parents' lack of knowledge about the homework content and lack of understanding of the task itself. This measure could overcome the challenges of PdPR implementation, as reported by Saifudin and Hamzah (2021). The study indicated that primary school children need guidance while studying at home. It also aims to avoid negative involvement as reported in a study by Cooper et al. (2000). In addition, this action can simultaneously overcome the challenges faced by parents from different knowledge backgrounds.

Apart from this study's contribution in developing guidelines for parental involvement in completing homework, the findings will contribute to the literature by providing insight into parents' inclination to engage in their children learning. This study found that parents are already involved in helping their children complete their homework even before the procedures were introduced. During the interviews, some of the parents shared that they supported implementing procedures to guide parental involvement to ensure that they can support their children learning in a positive and meaningful way. Studies involving periodical interventions, such as this study, also serve as a strategy to encourage parental involvement in homework completion as a practice. The guidance and support given through the procedure provided are expected to provide knowledge on a suitable method of involvement, the value of parental involvement, and encourage parental involvement as a continuous practice. This could increase the effectiveness and relevance of PdPR implementation, in line with the recommendation by MOE (2021) for parents to play a significant role in helping and monitoring their children in following instructions and completing the assignments and homework assigned by teachers.

5. Conclusion

In conclusion, a homework implementation policy involving parents must be formulated at the national level to determine the direction and add value to this practice. Its implementation should involve all parties, namely schools, teachers, parents, and children (Idris et al., 2014). Based on the above discussions, this study proposes developing a guideline for parental involvement in primary level science learning. It should involve assigning homework to complement and support the existing Primary School Science Curriculum (KSSR) to help children strengthen their understanding of science and develop science process skills. In the context of home-based learning, two important elements should be included to encourage parental involvement in children learning. These include skipping assigning homework on the

weekends to give ample time for completion. These aspects could ensure parents' optimal involvement in the learning process and interact with their children and teachers. Such interaction, in turn, will have a positive impact on children achievement.

As reported by Thai et. al. (2020), online learning is not as adequate as face-to-face learning. The issue has become increasingly critical in the learning of science during PdPR as it requires mastering science process skills that should be taught hands-on. Therefore, this study proposes the implementation of an interactive science homework to ensure that children can still carry out hands-on science activities and master science process skills.

The limitation of this study is that it only focused on teaching the most basic science process skills and only involved Year Three children and their parents. Therefore, the findings can only be generalized to children and parents with similar backgrounds as the study's participants. However, the findings could provide an insight into the real scenario of parents' involvement in completing their children's homework. Future studies are suggested to focus on more advanced science process skills and related topics in the Science subject to enrich the literature. In addition, researchers could examine topics like parental involvement among parents with more diverse socioeconomic backgrounds, the level of involvement based on the level, and the type of parental involvement to improve the existing practices.

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