# Development of 4-C Skills Implementation Model for Children inMuhammadiyah Orphanage in Medan City

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**ABSTRACT**

The rapid development of technology and the increasingly dynamic changes in the world of work require individuals to have skills that are not only focused on academic abilities, but also non- academic skills such as the 4Cs (Communication, Collaboration, Creativity, and Critical Thinking). Children in orphanages have a greater risk of experiencing developmental delays due to the lack of attention and stimulation from their family environment. The Muhammadiyah Orphanage is one of the institutions that provides protection and guidance to children in need, therefore efforts need to be made to improve the quality of guidance provided through the development of a 4C skills implementation model. This R&D study was conducted at the Muhammadiyah Orphanage in Medan, North Sumatra Province. The study population was all foster children in the orphanage, while the total sample size was 227 foster children. The pre-model test sample used in the study was 1 orphanage with 48 foster children as respondents. The limited trial phase I had a sample size of 56 respondents from 2 orphanages. The limited trial phase II had a sample size of 101 respondents from 4 orphanages. The limited trial phase III had a sample size of 227 respondents from 6 orphanages. Data was collected through inventories, observation sheets, interviews, and documentation. The research results showed that: (1) the IK-4C model is suitable for use in the management of education at the Muhammadiyah Orphanage in Medan to improve the 4C skills of foster children; (2) the output of the IK-4C model, which is the improvement of 4C skills in the model group, is significantly higher compared to the conventional group before the model was implemented; (3) the response from the program managers, orphanage management, and respondents to the implementation of the IK-4C model is quite satisfactory, both regarding the concept of the IK-4C model, its application in technical implementation, and their perception of the IK-4C model; and (4) the determining factors that influence the improvement of 4C skills in foster children are the improvement of communication skills, collaboration skills, critical thinking and problem-solving skills, as well as creativity and innovation skills that are included in 4C skills. The IK-4C model can be developed as an alternative implementation in education management. Development of 4-C Skills Implementation Model for Children in Muhammadiyah Orphanage in Medan City" is that the implementation of the IK-4C model has a significant effect on improving the 4-C skills (critical thinking and problem-solving, communication, collaboration, creativity, and innovation) of children in Muhammadiyah orphanage in Medan City. The results of the study show that the implementation of the IK-4C model has a positive impact on the children's skills, as evidenced by the significant increase in their scores in various aspects of the 4-C skills..

**Keywords:** Model IK-4C, Education Management, Orphanage, Foster Children

**INTRODUCTION**

The era of globalization and the fourth industrial revolution demands individuals to have skills relevant to technological and information development [1,2]. In this advanced digital and information age, these skills are considered essential for students to prepare them for the increasingly complex and demanding world of work [3,4]. The 4-Cs skills (creativity, collaboration, communication, and critical thinking) are seen as important skills to have in the 21st century [5,6]. These skills can help individuals face the challenges and demands of the future, yet many children still lack the ability to develop these 4-Cs skills. Therefore, there is a need for an effective and directed development model for implementing 4-Cs skills in children. The development of an implementation model for 4-Cs skills in children is important because these skills will help them prepare for a future that is increasingly complex and demanding. Creativity, collaboration, communication, and critical thinking skills can help children develop innovation, adapt to change, work with others, and make appropriate decisions [7,8]. The development of the Implementation Model for 4-Cs Skills in Children in Orphanages is an action plan designed to help children living in orphanages to develop critical thinking, communication, collaboration, and creativity skills [9]. This model aims to help orphanage children prepare themselves for their future and overcome the limitations of resources they often face. The observation results conducted by the researcher refer to the book "Implementing 21st Century Skills in Lesson Plan (RPP) 2017", in January 2020 on 48 children in three Muhammadiyah orphanages in Medan city, namely: (1) Muhammadiyah orphanage in Medan Kota with 12 children, (2) Muhammadiyah orphanage in Helvetia with 6 children, and (3) Muhammadiyah orphanage PDA Kota Medan with 30 children, were foun

Tabel 1.1 Observation Results of 4C Skills for Children at the Muhammadiyah Orphanage in Medan City

| No. | Description | Number of children | Percentage |
|---|---|---|---|
| *Critical Thinking and Problem Solving.* | | | |
| 1 | Using various types of thinking/reasoning or reasoning, both inductive and deductive, appropriately and according to the situation. | 21 | 43% |
| 2 | Understanding the interconnection between one concept and another in a subject, and the interconnection between concepts between a subject and other subjects. | 15 | 31% |
| 3 | Conduct assessments and determine decisions effectively in processing data and using arguments. | 14 | 29% |
| 4 | Examine results and establish connections between information and arguments. | 16 | 33% |
| 5 | Processing and interpreting the information obtained through initial conclusions and testing it through the best analysis. | 12 | 25% |
| 6 | Making solutions to various non-routine problems, both in a general way, and in their own way. | 17 | 35% |
| 7 | Using his abilities to try to solve the problem. | 13 | 27% |
| 8 | Compile and reveal, analyze, and solve a problem. | 11 | 22% |
| *Communication Skill* | | | |
| 9 | Understanding, managing, and creating effective communication in various forms and contents orally, in writing, and multimedia (ICT Literacy). | 13 | 27% |
| 10 | Using the ability to express their ideas, both during discussions, inside and outside the classroom, as well as in writing. | 15 | 31% |

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| No. | Description | Number of children | Percentage |
|---|---|---|---|
| 11 | Use spoken language according to the content and context of the conversation with the person you are talking to or the person you are communicating with. | 13 | 27% |
| 12 | Apart from that, oral communication also requires the attitude to be able to listen and respect the opinions of others,in addition to knowledge regarding the content and context of the conversation. | 21 | 43% |
| 13 | Using a logical flow of thought, structured according toapplicable rules. | 18 | 37% |
| 14 | In the twenty-first century communication is not limited to just one language, but multi-language is possible. | 12 | 25% |
| *Collaboration* **(kolaborasi)** | | | |
| 15 | Have the ability to work in groups. | 21 | 43% |
| 16 | Adapting to various roles and responsibilities, working productively with others. | 24 | 50% |
| 17 | Have empathy and respect different perspectives. | 19 | 39% |
| 18 | Able to compromise with other members in the group inorder to achieve the goals set | 17 | 35% |
| *Creativity and Innovation skills* | | | |
| 19 | Have the ability to develop, implement, and convey newideas orally or in writing. | 12 | 25% |
| 20 | Be open and responsive to new and different perspectives. | 17 | 35% |
| 21 | Able to express creative ideas conceptually and practically. | 13 | 27% |
| 22 | Using concepts or knowledge in new and different situations, both in related subjects, between subjects, and in contextual issues. | 12 | 25% |
| 23 | Using failure as a vehicle for learning. | 17 | 35% |
| 24 | Have the ability to create novelty based on prior knowledge. | 11 | 22% |
| 25 | Able to adapt in new situations and make a positive contribution to the environment. | 19 | 39% |

Research studies related to the development of the 4-C skills implementation model in children have shown positive results. Several studies have been conducted on the development of the 4-C skills implementation model. A study by Puspita and Sulistiyowati (2020) [10] showed that project-based learning model implementation can improve critical thinking, creative thinking, communication, and collaboration skills in students. A study by Lestari, Suryanti, and Listiani (2020)[11] showed that collaborative learning model implementation can improve communication and collaboration skills in students and provide a more positive and engaging learning experience. A study by Darmadi and Listiyandini (2019)[12] showed that technology-based learning model implementation can improve critical and creative thinking skills in students and provide a more engaging and interactive learning experience. A study by Gómez-Galán, García-Sánchez, Cañadas- De la Fuente, and Espino-Guzmán (2021)[13] showed that innovative learning model implementation can improve critical thinking, creative thinking, communication, and collaboration skills in students and provide a more active and interactive learning experience. A study by Herlina and Sari (2021)[14] showed that technology-based collaborative learning model implementation can improve communication and collaboration skills in students and provide a more engaging and interactive learning experience. Children living in orphanages often face conditions that are less supportive in developing their skills and potential. In addition, many orphanages do not have structured and systematic learning programs to develop 4-C skills in children. The development of

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an effective learning model is needed to help children in orphanages develop 4-C skills. Therefore, this study aims to develop a model for implementing 4-C (Critical Thinking, Communication, Collaboration, Creativity) skills in children at the Muhammadiyah Orphanage in Medan City.

### `MATERIALS

The type of research used in this study is Research and Development (R&D) method. The method used for implementing 4C skills in orphanage children, specifically in education management (planning, organizing, implementing, and evaluating), uses the Borg and Gall approach. This R&D study was conducted at the Muhammadiyah Orphanage in Medan City, North Sumatra Province. The study population was all foster children in the orphanage, while the total sample size was 227 foster children. In the pre-model trial, one orphanage was chosen as the respondent with 48 foster children. Limited trial phase I had a sample size of 56 respondents from two orphanages. Limited trial phase II had a sample size of 101 respondents from four orphanages. Limited trial phase III had a sample size of 227 respondents from six orphanages. Data was collected using questionnaires, observationsheets, interviews, and documentation.

### RESULTS

Below is a summary of the implementation results of the IK-4C model in Limited Trial I, LimitedTrial II, and Limited Trial III, as shown in Table 2.

Table 2 Summary of Implementation of IK-4C Model Limited Trials I, II, and III.

| Indikator | Experts | | Limited Trial I, | | Limited Trial II | | Limited Trial III | |
|---|---|---|---|---|---|---|---|---|
| | Average | Criteria | Average | Criteria | Average | Criteria | Average | Criteria |
| Indicator 1 | 4.5 | Tall | 4 | Tall | 4.8 | Tall | 4.85 | Tall |
| Indicator 2 | 4.3 | Tall | 4 | Tall | 4.6 | Tall | 4.65 | Tall |
| Indicator 3 | 4.4 | Tall | 4 | Tall | 4.7 | Tall | 4.8 | Tall |
| IP/IO | 4.4 | Tall | 4 | Tall | 4.7 | Tall | 4.77 | Tall |
| | IP | | IO | | IO | | IO | |

Based on the table above, it is known that the average value of the Expertise Performance Index (IP) is 4.4 with a high category. The average value of IP/Organization Index (IO) from the observer in limited trial I is 4 with a high category. The value increased in limited trial II with an average IP/IO score of 4.7 with a high category, and increased again in limited trial III with an average IP/IO score of 4.77 with a high category. These results indicate that the IK-4C model tested in limited trials I, II, and III overall has a positive or high category, so the testing of the IK-4C model meets the effectiveness and practicality criteria. The IK-4C model (Implementation of Critical Thinking and Problem Solving, Communication, Collaboration, and Creativity and Innovation skills) is formed through three groups of activities, namely preliminary studies (pre-development), model development, and testing (model application). This theoretical model will be developed in the development stage. This prototype can be created or modified from existing products to obtain a draft prototype model that is ready to be tested in the field. In this development stage, the development direction of the IK-4C model implementation at the Muhammadiyah Orphanage in Medan is formulated based on the transition needs of the orphanage and its scope. The target of this model implementation is to improve the 4C skills of foster children in the form of critical thinking and problem- solving skills, communication skills, collaboration skills, as well as creativity and innovation skills. This theoretical model design is discussed with practitioners (lecturers/instructors, experts) who have relevant expertise in the field of educational management. The involvement of practitioners and academics to assess the developed model design is carried out through a Focus Group Discussion (FGD). The input results from the FGD are used to revise the model and are referred to as a hypothetical model. This hypothetical model will be further developed in the testing (model application) stage, and the model will still undergo revisions based on the results of limited testing conducted at the designated orphanage. The hypothetical model will be tested in limited trials in stage I, stage II, and stage III. Before conducting limited trials, the 4C skills are assessed. After limited trial I, an evaluation is conducted to see the achievement of 4C skills attained by foster children at the Muhammadiyah Orphanage in Medan. Then, the revised hypothetical model is tested again in limited trials II and III.

Evaluation is also conducted after limited trials II and III to see the progress and changes that occur. Ultimately, the evaluation results show that the IK-4C model tested in limited trials I, II, and III can improve the 4C skills of foster children at the Muhammadiyah Orphanage in Medan. This means that the model is effective and practical to be applied at the orphanage. Furthermore, this model can be developed and applied to other orphanages or even to other educational institutions. In addition, this research also provides benefits for the development of better and more effective learning models in improving student skills in facing global challenges in the future.

Table 3 Summary of Observations in Limited Trial I with Limited Trial II and Limited Trial III

| Application | | Kategori | | | | total |
|---|---|---|---|---|---|---|
| | | High | Enough | Less | Low | |
| Limited Trial I | $X_1$ | - | 71,43% | 28,57% | - | 100% |
| | $X_2$ | - | 73,21% | 26,79% | - | 100% |
| | $X_3$ | - | 66,07% | 33,93% | - | 100% |
| | $X_4$ | - | 76,79% | 23,21% | - | 100% |
| Limited Trial II | $X_1$ | 25,74% | 74,26% | - | - | 100% |
| | $X_2$ | 18,81% | 81,19% | - | - | 100% |
| | $X_3$ | 2,97% | 95,05% | 1,98% | - | 100% |
| | $X_4$ | 16,83% | 81,19% | 1,98% | - | 100% |
| Limited Trial III | $X_1$ | 62,11% | 37,89% | - | - | 100% |
| | $X_2$ | 59,47% | 40,53% | - | - | 100% |
| | $X_3$ | 57,71% | 42,29% | - | - | 100% |
| | $X_4$ | 25,11% | 74,89% | - | - | 100% |

Based on the table, it is clear that there was an increase in the 4C skills of the children in Muhammadiyah Orphanage in Medan City as a result of the implementation of the IK-4C model by the orphanage head during limited trials I, II, and III, which led to an improvement in the children's skills. It is explained that there was an increase in the Communication Skills indicator, Collaboration Skills indicator, Critical Thinking and Problem Solving Skills indicator, and Creativity and Innovation Skills indicator. This indicates that the IK-4C model has a positive and significant impact on improving the skills of the children in Muhammadiyah Orphanage in Medan City.

**DISCUSSIONS**

The research results indicate that the IK-4C model has a significant effect on improving the skills of children in Muhammadiyah Orphanage in Medan, which includes 25 aspects (indicators). The twenty- five (25) points in the experimental group of limited trials I, limited trials II, and limited trials III have significantly higher percentage values and averages compared to the conventional group (before the model was applied), or what is called pre-model. Furthermore, in the questionnaire results, an increase in the value of the children's skills in the orphanage can be seen from the improvement of aspects such as critical thinking and problem-solving skills, communication skills, collaboration skills, and creativity and innovation skills. This also shows that other known variables that are influenced by the implementation of the IK-4C model can be seen from the increase in the value of 4C skills of the children in the orphanage. The response from the heads of the orphanage, officials, and caregivers about the implementation of the IK-4C model is also positive. This can be seen from their satisfaction with the application of the model in order to improve the skills of the children in the orphanage. Including the increase in their understanding of the concept of the IK-4C model and the soft skills that

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can be trained by applying the model in their work at the orphanage. In the implementation of this model, the head of the orphanage, officials, and caregivers provide good guidance. In addition, with the process they experience, they have longer and more extensive experiences, so that the opportunity for reflection, generalization, abstraction, and transfer in experiential coaching is deeper. The experience gained from the implementation of this model can change the habits of the children in the orphanage in their behavior, which was previously too conservative, to be better and more orderly, so that the expected results for their future will be achieved. Descriptive analysis results of 4C skills (critical thinking and problem-solving skills; communication skills; collaboration skills; creativity and innovation skills) in the orphanage at the pre-model stage were dominated by percentage values in the sufficient and insufficient categories. Furthermore, after the implementation of the IK-4C model in limited trial I, higher percentage values were obtained than before (pre-model), but still in the sufficient and insufficient categories.

This research is in line with several other studies. For instance, Sukowati and Purnomo (2020)[15] conducted a study on the implementation of the 4C learning model and the critical thinking ability of high school students. The results showed that the application of the 4C learning model could improve students' critical thinking ability. Salihin and Yuniarni (2019)[16] conducted a study on the effect of the 4C skills-based learning model on students' problem-solving ability. The results showed that the use of the 4C learning model could improve students' problem-solving ability. Kurniawan and Utami (2021)[17] conducted a study on the effect of the problem-based learning model based on the 4C skills on students' learning outcomes. The results showed that the use of the 4C learning model could improve students' learning outcomes. Triyanto, Kusumawati, and Widayanti (2019) [18] conducted a study on the influence of blended learning model on high school students' learning outcomes and 4C skills. The research results showed that the use of blended learning model can improve students' learning outcomes and 4C skills. Utomo and Djatmika (2020) [19] conducted a study on the development of a 4C-based learning module for cultural arts subject in the 10th grade of high school. The research results indicated that the 4C-based learning module can improve students' skills in the cultural arts subject. Wahyuni and Ramadhani (2019) [20] conducted a study on the influence of 4C- based learning model on students' learning outcomes. The research results demonstrated that the use of 4C learning model can improve students' learning outcomes.

**CONCLUSION**

Development of 4-C Skills Implementation Model for Children in Muhammadiyah Orphanage in Medan City" is that the implementation of the IK-4C model has a significant effect on improving the 4-C skills (critical thinking and problem-solving, communication, collaboration, creativity, and innovation) of children in Muhammadiyah orphanage in Medan City. The results of the study show that the implementation of the IK-4C model has a positive impact on the children's skills, as evidenced by the significant increase in their scores in various aspects of the 4-C skills. The implementation of the model was also well-received by the orphanage's leaders and caregivers, who reported improved understanding of the concept of the IK-4C model and the soft skills that can be developed through its implementation. The study suggests that the IK-4C model has the potential to transform the behavior of the children in the orphanage, improving their future prospects. All limited trials I, II, and III have yielded satisfactory results in the implementation of the model, demonstrating that the 4C skills of foster children can be improved through the application of the IK-4C model. As a result, a final model was obtained that has been verified and can be used in other orphanages to improve the 4C skills of foster children. The response to the implementation of this model is considered satisfactory, both in terms of its concept, technical implementation, and the perception of participants who run the model. This can increase understanding and develop soft skills for participants in the application of the IK-4C model. The implementation of the IK-4C model at the

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Muhammadiyah Orphanage in Medan, North Sumatra Province, has had a significant impact on improving the skills of foster children. This is evident from the significant increase of 25 points in the observation table in each limited trial conducted in I, II, and III, and is directly proportional to the increase in the distribution of questionnaire scores for respondents in the limited trials I, II, and III."

## CONFLICT OF INTEREST

The author declares no conflict of interest

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