

# FACTUAL MODEL OF INFORMATION TECHNOLOGY ASSISTED ECE CURRICULUM MANAGEMENT

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## ABSTRACT

Curriculum management is a very important part of educational management. Curriculum management creates systematic work steps starting from planning, organizing, implementing, and evaluating curriculum. Through information technology-assisted ECE curriculum management, it is easier for principals and teachers to develop a curriculum that facilitates children's learning needs. The objective of this research was to examine and analyze the factual model of information technology-assisted ECE curriculum management that has been practiced so far has contributed to the development of a curriculum that is in accordance with the needs. The qualitative research method was used to obtain in-depth data and carried out interactively as needed. The subjects of this study were the principals and teachers at Taman Kanak-kanak Negeri Pembina and PAUD Lab School UNNES, Semarang. Data collection was carried out by questionnaires, interviews, and Focus Group Discussions (FGD). The results of this research on the factual model of information technology-assisted ECE curriculum management obtained fairly results, and it is necessary to adapt the use of information technology in curriculum management. The implication is that an in-depth study is needed in the field of curriculum management by utilizing information technology in order to provide more effective and innovative curriculum development services according to the needs of children, institutions and society.

**Keywords:** *Factual Model, Curriculum Management, ECE, Information Technology*

## 1. INTRODUCTION

Currently, early childhood education becomes a very interesting study. Many studies on ECE are related to the progress of the nation's future, economic development, and preparation of a high-quality generation. Based on these studies, it can generally be interpreted that ECE is a service that provides complete stimulation to achieve the goals developed. The development of ECE institutions' goals must be managed properly so that they can be achieved, one way that is used is through good and high-quality curriculum management.

The quality of services for early childhood education programs supports the success of students. Lack of understanding of teachers or educators in curriculum management is an obstacle in improving the quality of ECE services [1]. Curriculum management is an effort to facilitate the achievement of teaching goals, especially efforts to improve the quality of teaching and learning interactions [2].

The ECE curriculum is a set of plans regarding the learning goals of early childhood ranging from 0 to 6 years of age which intends to develop children's potential optimally [3]. The curriculum needs to be designed with the

orientation to the customs, culture, and habits of the community because the development of the cultural curriculum is the foundation of development [4]. In ECE institutions, principals and teachers must carry out new curriculum management so that the learning process can run well according to needs [5].

The results of the study prove that effective curriculum management can increase students' creativity [6]. Curriculum management system design, facilitating curriculum development according to regional characteristics, ECE institution conditions, culture and children's needs so that curriculum development is adjusted to the education unit [7]. Curriculum management is carried out by institutions to achieve the stated goals. Curriculum management in practice has been implemented by ECE institutions to be able to provide steps for curriculum development used by institutions. Steps that can provide convenience in today's era by utilizing information technology.

In the development of curriculum management, to achieve the goals of the institution requires support in the form of information technology that can be developed to provide practical and effective services. Through the use of information technology in curriculum management carried out by principals and teachers, it is easier to plan, organize, and implement to the evaluation stage. Good use of information technology is believed to be able to improve the quality of education, but in reality, there are still many institutions that have not used information technology properly [8]. Information technology can enhance teaching and learning through its dynamic and interactive approach [9]. Thus, the application of curriculum management with the help of information technology at ECE institutions aims to provide more effective work steps.

The conditions of ECE institutions are very diverse, including in the implementation of curriculum management. It is interesting to analyze whether the management that has been implemented so far provides easy services for principals and teachers to develop the curriculum, or in the curriculum development process there are still obstacles that must be solved together.

Based on the background, that curriculum management plays a very important role in achieving goals and its implementation is adjusted to conditions, policies that exist in the institution. In general, the practice of implementing curriculum management based on the findings in the field is

carried out in conventional and innovative ways through the use of information technology. The study in this article is specifically to analyze how information technology-assisted ECE curriculum management practices have been implemented by the institution and to find out the obstacles that exist in the curriculum management process.

## 2. LITERATURE REVIEW

### 2.1 ECE Curriculum Management

In the field of educational management, the term curriculum often appears, which is related to curriculum management, curriculum design, curriculum development, curriculum organization, curriculum implementation, curriculum evaluation, curriculum changes, curriculum politics, and others. Thus, the study of the curriculum in the field of education management is a very broad scientific field.

The curriculum is a set of plans and arrangements regarding the objectives, content, and learning materials, as well as the methods used as guidelines for the implementation of learning activities to achieve educational productivity [10]. Curriculum theory gives direction and guidance in the process of curriculum planning, development, implementation, supervision, evaluation among others [11]. Thus, in general, the curriculum makes a very large contribution to support the achievement of educational institutions' goals.

In the study of curriculum, curriculum management is a science that is very important to be mastered by both the principals and the teacher in order to be able to develop a curriculum that is in accordance with the needs of children, institutions and society. Through good curriculum management, principals and teachers can provide learning services according to the conditions and needs. For example, the curriculum during the Covid-19 pandemic was simplified according to the needs of children, with the implementation of learning models delivered through the network (online) [12]. Thus, through curriculum management, institutions can implement learning methods that suit the conditions and developments in society and various kinds of needs for early childhood.

Success in curriculum management will affect the development of educational institutions in implementing learning and achieving institutional goals. Through ECE curriculum management, the work steps for implementing high-quality learning become more effective. Thus, theoretically, the

study of curriculum management at ECE institutions is very important and requires in-depth study to provide a strong basis in developing a high-quality ECE curriculum.

The practice of curriculum management, in its implementation, refers to the national curriculum developed according to the needs of each institution [13]. According to [14], curriculum success is supported by good curriculum management, starting from planning, organizing, implementing, and evaluating. Curriculum management is also very important for institutions that integrate two curricula that run concurrently. Furthermore, based on the results of research by [15], curriculum management is divided into four stages, namely: 1) curriculum planning is designed according to the vision, mission, and goals of the institution, 2) curriculum organization contains the needs of the institution, 3) curriculum implementation in classroom learning activities, 4) Control or assessment is carried out by students and educators.

Implementation of curriculum management needs to be supported by teachers, parents, school committees, and the surrounding community. A good curriculum is prepared by teachers who understand the curriculum and communicate to all parties within the educational institution [16]. In line with the results of the research above, curriculum management requires understanding and coordination from school principals, teachers, parents, communities, and stakeholders to produce curriculum document development that suits the needs and is in harmony with early childhood development.

Early childhood education is an institution that is given the authority to manage and develop a curriculum as needed, but in practice, the ECE institution has not developed a curriculum that meets the needs through effective work steps. The implemented curriculum still uses a standardized curriculum and the vision, mission, and goals of the institution have not well developed.

Based on the literature review on curriculum management, especially in the ECE field, it can be used as a basis for reviewing the factual model of curriculum management that has been implemented. This factual model is a real condition of curriculum management that has been applied so far. The study of factual models obtained, in the next stage, can be used as the development of a more systematic model in

curriculum management so that it can run better in ECE institutions.

The factual model of curriculum management is the basic steps that have been implemented by principals and teachers to develop a curriculum that is applied to institutions. This factual model, in the form of an existing model, without any modification from the researcher, but the results of the factual model can be developed for the development of better curriculum management.

## 2.2 Information Technology

Education is required to be ready to face various challenges, one thing that can be prepared is through increasing teacher competencies in the ECE curriculum. The rapid development of technology at this time must be anticipated by all educational institutions, including at the level of early childhood education. Educational institutions are encouraged to take advantage of developments in information technology to facilitate and assist learning practices. In addition to the learning process, the use of information technology plays an important role in the implementation of curriculum management which can provide convenience for principals and teachers in developing a curriculum that suits the needs of children.

Currently, all activities and work can be facilitated by information technology, as well as in the implementation of education. This can be done by developing various kinds of innovations in the use of information technology for various purposes in the management of educational institutions. Many national policies and curricula have guided the use of technology in the early years [17]. The integration of digital technology into ECE can support the professional development of teachers [18].

The application of information technology is influential in the world of education because it can improve the quality of educational services to customers [19]. Information technology in ECE institutions can contribute to the development of institutions to be more effective in the curriculum management process. In addition, unpreparedness in the use of technology will hinder progress in institutional development. There is a need for follow-up activities in the form of intensive assistance for ECE institutions that apply early childhood information systems [20]. Thus, every ECE institution needs to use and follow the development of information technology to support

the development of educational institutions to become a high-quality institution.

In recent times, the demand and use of information and communication technologies have increased tremendously and this has made it to be an indispensable device in all educational systems [21]. The use of information technology, especially in the world of education, is very important, because almost all educational institutions use technology to support the performance of employees and teachers.

Based on the research results, it is explained that academic data management in educational institutions, especially in ECE, still needs to be considered because at this time the implementation of data management is still manual [22]. The implementation of information technology in curriculum management at ECE institutions acts as a tool that provides convenience in curriculum development. In fact, in institutions, the implementation of curriculum management already exists that utilizes information technology in the form of computer programs with simple steps and has not used specific program applications.

Skills in using information technology are increasingly needed in the development and management of effective and quality learning [23]. Meanwhile, the curriculum is a program designed by principals, teachers, and development teams to provide the best service to children or the younger generation [24]. Thus, it can be concluded that the use of information technology aims to provide convenience in curriculum management so that principals, teachers, and the parties involved can develop the curriculum in systematic and effective ways at each ECE institution.

### 3. RESEARCH METHOD

Qualitative research is used to obtain in-depth and meaningful data [25]. This research was conducted interactively according to research needs, namely to collect information in the field of information technology-assisted curriculum management that has been practiced so far. The respondents of this study were the principals and teachers at Taman Kanak-kanak Pembina and PAUD Lab School UNNES, Semarang. The objectives of this study were to examine and analyze the factual model of information technology-assisted ECE curriculum management that has been carried out so far and try to find the best solution through a constructive approach.

Data collection was carried out by questionnaires and Focus Group Discussions (FGD) to examine the factual curriculum management practices that have been implemented. Questionnaires were used to find data on quality ECE curriculum management practices assisted by information technology that has been implemented at the institution. The data obtained through questionnaires and FGDs were then analyzed as a basis to understand and explore the factual model of information technology-assisted ECE curriculum management. After the data was obtained, it was then presented to represent the factual model that has been developed and implemented. Then, it was consulted with a score table adapted based on the interpretation of scores [26], as follows:

*Table 1. Score Interpretation Percentage*

No.	Percentage (%)	Criteria
1	80 – 100	Excellent
2	66 – 79	Good
3	55 – 65	Fairly
4	40 – 55	Less
5	30 – 39	Poor

## 4. RESULT AND DISCUSSION

### 4.1 Result

Curriculum management is carried out by the institution to achieve the stated goals. Curriculum management in practice has been implemented by ECE institutions which aim to provide steps in developing the curriculum used in institutions.

The practice of curriculum management in ECE institutions is carried out in various ways according to the ability of the institution in its implementation. For example, some institutions start from how to plan, others start from how to organize, even sometimes, some institutions only implement the existing curriculum. Curriculum management is implemented at the institution with the aim that the curriculum runs effectively according to the vision and mission of the institution. Curriculum management can produce curriculum documents that can facilitate the needs and quality of education services.

The factual model construction of curriculum management is a model that has been implemented in ECE institutions. This study examined the implementation of curriculum management with the help of information technology at the institution and the steps taken in curriculum management. Based on the research

results obtained through questionnaires and FGDs conducted at Taman Kanak-kanak Pembina and PAUD Lab School UNNES, Semarang, the construction of ECE curriculum management assisted by information technology can be presented.

Research on the factual model obtained is focused on information technology-assisted curriculum management that has been implemented, this is interesting because the curriculum management applied to every institution that utilizes information technology is adjusted to the ability of the institution. This is also reinforced that teachers in implementing curriculum management use assistance computer but have not used the system or application program [7]. So in previous studies that teacher practices have used computer assistance, this study examines whether computer programs or information technology that have not been systematically developed as a guide for principals and teachers in managing the curriculum and producing a curriculum that is in accordance with the expectations of the institution.

The factual model or model that has been applied to ECE institutions, based on the research results on the factual model of information technology-assisted ECE curriculum management, was developed with the following steps:

1. Curriculum Management is a part of education management to provide convenience in developing an effective curriculum according to the institution's vision and mission. Curriculum management, at this time, is very important to anticipate various changes that occur. Through curriculum management, curriculum development and learning programs can be managed according to needs.
2. The 2013 ECE Curriculum, is a curriculum that is being implemented at ECE institutions that contain objectives, learning outcomes, processes, and content according to the level of child development to build the knowledge, skills, and attitudes needed to support children's readiness to learn at further education levels. Various aspects that have been developed include: religious and moral values, physical-motoric, cognitive, language, social-emotional, and art.
3. Curriculum Planning, ECE institutions carry out curriculum planning as needed based on the 2013 ECE curriculum or the national curriculum to be implemented in the institution and each class. Thus, ECE institutions implement the curriculum that has been set within a certain time until there is a change in

the applicable curriculum. Planning activities, sourced from the 2013 ECE curriculum, vision and mission, as well as development from principals and teachers. Planning uses a computer, but has not been integrated with an effective system.

4. Curriculum Organizing, ECE institutions develop various formulations in the curriculum which are developed into learning programs based on the characteristics of ECE institutions. Principals and teachers develop various learning programs based on program planning into curriculum documents, annual programs, semester programs, weekly programs, and daily programs.
5. Curriculum Implementation, principals and teachers implement the curriculum in learning activities based on the programs that have been developed. Implementation of learning to achieve learning objectives in planning and organizing the determined curriculum.
6. Curriculum evaluation, evaluation is conducted to determine the results of the implementation of learning that is developed based on the planning, organization, and implementation of the curriculum that has been carried out. Evaluation of the results of child development is carried out to provide various considerations in the curriculum whether it is appropriate or there are still many things that need to be improved and developed so that the curriculum suits the needs.
7. Revision, at this stage, improvements are made at every step of curriculum management to produce curriculum planning, organizing and implementation, and various learning tools according to the needs of institutions and early childhood. Revisions are made to the steps of information technology-assisted curriculum management which are still lacking and require the best solution.
8. Final curriculum document, is the result of curriculum management in the form of a final document developed through various stages in ECE institutions so that it becomes a curriculum document that is ready to be implemented in learning. This final curriculum document is developed through curriculum management which begins with planning, organizing, implementing and evaluating curriculum.

According to the steps above, curriculum management is very important to support the achievement of high-quality institutions. Based on the research results, in detail, the factual model of

information technology-assisted curriculum management in ECE institutions is as follows:

management at ECE institutions obtained the following results:

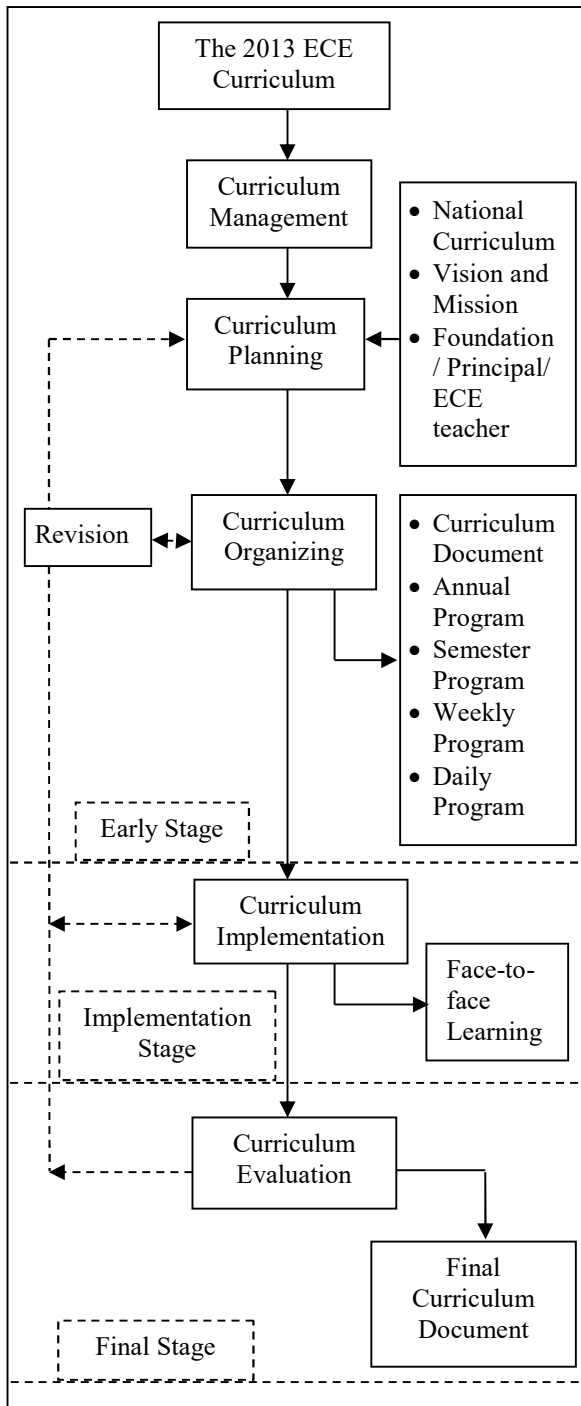


Figure 1. Factual Model of Information Technology-Assisted ECE Curriculum Management

The questionnaires distribution given to principals and teachers about the factual model of information technology-assisted curriculum

Table 2. Factual Model of Information Technology-Assisted ECE Curriculum Management

No	Statement	Score (%)
1	Identifying needs in curriculum planning	70
2	Getting input from various parties on curriculum planning	65
3	Applying curriculum management in curriculum development	65
4	Curriculum management involves all development teams	65
5	Implementation of curriculum management in the form of planning, organizing, implementing, and evaluating.	65
6	Through curriculum management, curriculum development is more flexible	60
7	Curriculum management can promote institutional excellence in the developed curriculum	70
8	Through curriculum management, the contents of the institutional, local and national curriculum are combined in a balanced way	50
9	Curriculum management makes curriculum development easier	65
10	Using information technology in curriculum management	65
11	Information technology makes curriculum management easier	65
12	The need for adaptation of information technology in curriculum management	55
13	Principals and teachers implement curriculum management with the help of information technology	70
14	Curriculum management with the help of information technology has minimal risk	65
15	Curriculum management with information technology accelerates the work process	70
16	The use of information technology in curriculum management increases work motivation	60

17	The use of information technology facilitates ECE curriculum development	70
18	The use of information technology facilitates the development of annual programs and semester programs	70
19	Information technology makes easy steps in the development of weekly program and daily program	65
20	Information technology facilitates curriculum management according to the specifics of the institution	65
Average score (%)		64.75

According to the table on the implementation of information technology-assisted ECE curriculum management, an average score of 64.75% was obtained from the highest achievement of 100%. The data is in line with the table that has been adapted above, showing that the construction of the factual model of technology-assisted curriculum management in the institution is running running on fairly categories and better assistance is needed, through a systematic way of curriculum documents development that suit the needs.

These results also show that curriculum management in institutions has a very important role. However, its implementation needs to be improved with better steps. Based on the average total score obtained from the questionnaire, curriculum management at the institution still needs an in-depth study so that the curriculum development process can be carried out better and more effectively.

The implementation of information technology plays an important role in all fields, including in the field of education which is related to the field of curriculum studies. The practice of using information technology in ECE institutions is also very varied according to the needs of the institution. For example, it is used in classroom learning. In addition to learning, information technology in institutions can also be used to provide convenience in managing the curriculum carried out by school principals and teachers. The implementation of information technology in curriculum management at ECE institutions has not been used optimally, only limited to the use of programs that are commonly carried out such as data and document management programs.

Apart from the data obtained through the questionnaire presented in the table above regarding the factual construction of ECE curriculum management with the help of information technology, in the next stage, a limited FGD was conducted, the following results were obtained:

*Table 3. Description of Factual Construction on Information Technology-Assisted ECE Curriculum Management*

No	Indicator	Result
1	Identification of needs in curriculum planning	It has been carried out at the level of studies or discussions but has not yet reached the stage of real implementation in the field. Thus, the identification of needs in curriculum planning has not run optimally.
2	Identification of curriculum development needs using information technology	Identification of needs in institutions through the use of information technology in curriculum development is running by utilizing computer programs that are not yet systematic.
3	Curriculum development practices at institutions	Requires assistance in implementing information technology-assisted curriculum management and developing a more effective system, thereby providing complete information about the development of the ECE curriculum
4	Curriculum linkage with the development of other programs	There are program developments that still need to be aligned with the curriculum developed by the institution.
5	Obstacles in curriculum management	At the stage of planning and organizing the curriculum, the implementation has not been effective and requires a lot of time to implement the curriculum

According to the table on the construction of the factual model of curriculum management at ECE institutions assisted by information technology, the results obtained through limited FGD activities that curriculum management has been implemented by the institution. The results of the implementation of curriculum management in developing a curriculum that suits the needs of the institution still require studies so that curriculum management can be applied in more practical ways.

The research data obtained in general show that curriculum management has not yet fully resulted in the development of the best curriculum documents according to needs. For this reason, innovative steps are needed through effective ways of curriculum management by using the assistance of information technology to provide convenience for principals and teachers in curriculum development.

#### 4.2 Discussion

Curriculum Management at ECE institutions is carried out to develop a curriculum that suits the needs of students, institutions, and the community. The results of curriculum development are carried out by institutions to produce curriculum documents that can provide the best learning services for children. A well-developed curriculum, of course, is facilitated by various materials and stimulation programs that suit the needs. Curriculum management results in the development of activity programs that are suitable for children and can lead to the achievement of quality services. The education process needs to be implemented in curriculum management so that planning, implementation and evaluation of the curriculum is effective, efficient, and optimal in empowering various learning resources, learning experiences, and curriculum components [27].

The curriculum is a very important component in learning which leads to the achievement of children's goals and expectations [28]. The curriculum is implemented at each institution according to their conditions. The data of factual model construction obtained are the stages of curriculum management that still use conventional methods or have not been integrated with the system. Thus, the curriculum development process still takes a long time and is not systematic.

Implementation of curriculum management by considering various needs of the institution to achieve the institution's objectives. Implementation of curriculum management in the

field requires assistance and guidance so that curriculum development and learning offered to students can be planned according to the child's development. Based on the results of the FGD, the curriculum planning activities carried out still need to be improved, so that the planning activities produce innovative programs. The ability of heads of institutions and teachers to develop, implement and evaluate curricula is a determining factor in curriculum development at institutions

The ECE curriculum is a learning and playing program plan that is facilitated by the institution so that students develop according to their goals. Curriculum planning is an activity carried out to make decisions to determine future activities in order to achieve the expected goals [29]. The curriculum has a very important role considering its function as a tool to describe educational programs so that they can be carried out in a planned and systematic manner [30]. In practice, curriculum development provides an opportunity for institutions to develop the advantages offered to achieve the objectives set by the institution.

The curriculum is an ideal design, which contains a learning development program implemented by teachers in educational institutions. This ideal curriculum design is used in the implementation of learning so that students are stimulated in their development aspects according to the needs of children, institutions, and society. The practice of curriculum development can theoretically refer to various existing curriculum development models. Educational institutions can also determine a curriculum development model by considering the various advantages it has, the possibility of convenience in achieving curriculum goals, and not contradicting the current education system.

According to the research results, the curriculum development process has implemented curriculum management even though the results are still in the sufficient category. Implementation of curriculum management in ECE institutions starts from core competencies and basic competencies planning that have been developed and become government decisions to be implemented. Therefore, the organization and implementation of the curriculum at each institution refer to core competencies and basic competencies that have been decided by the government in the 2013 ECE curriculum.



The development of core competencies and basic competencies in the 2013 ECE curriculum depends on the demands and creativity of teachers in developing learning activity programs that are developed. Thus, ECE institutions develop learning programs based on core competencies and basic competencies developed by the government and become an achievement in the implementation of learning activities in early childhood education units. Institutions are given the authority to develop plans. The task of the institution is given the authority to develop program planning based on the specified competencies, followed by the development of curriculum documents, annual programs, semester programs, weekly programs and the development of daily programs that will be implemented by the institution.

Referring to the data of the factual model construction of information technology-assisted curriculum management, the average score is 64.75%. It can be used as the basis that the implementation of curriculum management still needs to be improved, including by using information technology so that curriculum management steps can be carried out easily. According to Yılmaz [31] today, the use of technology has become a necessity, not a privilege. The utilization of Information and Communication Technology for education, triggering changes that affect the way people learn and teach, poses new challenges for students, teachers and institutions [32]. Based on the opinion above, ECE institutions are very appropriate to implement information technology to develop the competence of principals and teachers.

Information technology-assisted ECE curriculum management aims to provide steps in developing a curriculum that is better and suits the needs of children, institutions, and society. Implementation of curriculum management carried out by institutions to produce good curriculum and learning tools according to the goals determined. Implementation of information technology-assisted curriculum management in ECE institutions is carried out by managers/principals and teachers to develop curriculum documents that can run effectively and can facilitate various needs in learning activities that suit the achievement of children's development.

The factual model of information technology-assisted curriculum management is a

model that has until now been implemented in ECE institutions. Based on the research data on the construction of factual models, the use of information technology in curriculum management is still not optimal. This is also reinforced through interviews. In practice, curriculum management has not run effectively and has not used information technology to help the curriculum development. This result is also in line with the research by [33], [34] which stated that the development of information technology aims to make daily work easier and faster. Professional teachers must have knowledge, confidence and skills using information technology [35]

Principals and teachers at ECE institutions must be able to adapt and try to keep up with changes that occur through the use of information technology. Utilization of information technology in early childhood education helps facilitate curriculum management which is used as a means of developing curriculum documents and programs. The obstacles found in the factual model are planning and organizing the curriculum, it is necessary to find the best solution through the development of information technology, so that the implementation of curriculum management can produce a good curriculum.

Based on the results and discussion of the factual model, an in-depth study is still needed to make a curriculum management model that contributes to the practice of learning in institutions. On the findings of factual models that need to be followed up, especially in curriculum planning and organizing activities. Departing from the factual model construction, it is necessary to develop a curriculum management model in ECE institutions that can be carried out with systematic steps to produce better and high-quality curriculum documents. The factual model obtained is then used as the basis for developing a curriculum management model that utilizes information technology, so that work in curriculum management from planning to organizing, implementing and evaluating can be carried out properly.

## 5. CONCLUSIONS AND SUGGESTIONS

Based on the results of research and discussion of the factual model of information technology-assisted curriculum management implemented in ECE institutions, it is in the fairly category, so studies and assistance are needed at institutions so that curriculum management that

utilizes information technology can be implemented properly and according to the goals of institutional development.

Implementation of information technology-assisted curriculum management in the current era is a necessity that must be properly facilitated by each institution in order to have a good impact in supporting the duties of the head and teacher, in developing curriculum programs that are in accordance with the needs of the institution.

Based on the results and discussion, suggestions for further research are as follows:

1. The factual model of information technology-assisted curriculum management in this study, using respondents and a limited area, so that further research is needed that is wider in order to produce an appropriate curriculum management model at the ECE level
2. The factual model obtained in this study is the initial information for development. So that further research is needed on ECE curriculum management assisted by information technology, so that it becomes a curriculum management model that is more practical, effective and easily adapted by principals and teachers.

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