



# Supporting the Development of Critical Thinking in Early Childhood Education

Kia Jouppila

2021 Laurea





Laurea-ammattikorkeakoulu

# Supporting the Development of Critical Thinking in Early Childhood Education

Kia Jouppila  
Social Services/Degree Programme  
Thesis  
June/2021

Kia Jouppila

Year	2021	Pages	42
------	------	-------	----

---

The purpose of this thesis was to examine critical thinking and how the development of a child's critical thinking skills can be supported in early childhood. The theoretical framework in this thesis consists of early childhood education in Finland, critical thinking from philosophical point of view and theories of child's cognitive development.

Data collection in this thesis was done by using literature review. The aim was to answer the following research questions: *How is it possible to support the development of critical thinking skills amongst children within the age of 0-6 and which methods adapted to early childhood education support the development of critical thinking?* Data collection was conducted by searching Ebook central, EBSCOhost combined, Finna, Google scholar, Sciencedirect (Elsevier) and Proquest central. An adequate amount of suitable literature material was available. Finally, five suitable studies were chosen for analysis.

The literature review data was analyzed using content analysis. This method helped explore the concepts and gain more in-depth understanding of critical thinking, especially how its development can be supported and highlight why it is important to do so in early childhood.

The main findings demonstrated that critical thinking is formed by a set of skills and attributes which can be developed already early in life. Early childhood educators have an important role with choosing the most suitable methods and maintaining an environment which fosters the development of critical thinking.

This literature review is suitable for anyone working in the field of early childhood or to caregivers interested in development of critical thinking.

Keywords: Critical thinking, Early Childhood Education

## Table of contents

1	Introduction .....	6
2	Theoretical framework.....	7
2.1	Early Childhood Education.....	7
2.1.1	From “daycare” to early childhood education .....	7
2.1.2	National core curriculum for early childhood education and care .....	9
2.2	Critical Thinking .....	11
2.2.1	Critical thinking in philosophers’ eyes .....	12
2.2.2	Harvey Siegel & critical thinking.....	13
2.3	Developmental psychology .....	14
2.3.1	Piaget & cognitive development .....	16
2.3.2	Vygotsky & cognitive development .....	17
3	Methodology.....	19
3.1	Purpose, Aim & Research questions .....	19
3.2	Literature review .....	19
3.2.1	Inclusion & Exclusion criteria.....	21
3.2.2	Data search process.....	23
3.2.3	Content analysis.....	26
3.2.4	Trustworthiness & Ethical issues .....	29
4	Research findings/Results .....	29
4.1.1	Development of critical thinking.....	30
4.1.2	Methods in early childhood education.....	31
4.2	Discussion on findings .....	32
5	Conclusion .....	35
	References .....	37
	Appendices.....	42

## 1 Introduction

In today's world where we keep getting hit with different kinds of information in various platforms, it is not unusual to keep finding ourselves thinking more and more about how to pick out accurate information from a sea of non-fact-based information or bias opinions. There are many patterns in our living habits which should be re-evaluated, changed, or leave in the past entirely. It is easier said than done. For human nature, change seems scary. The uncertainty of not knowing the outcome makes us want to stick with old habits (Razzetti 2018). Here lays one of the reasons for difficulties in seeing the flaws in our doings and changing our behavior; This would mean a change needs to happen.

With all more reason, we must pay attention to our critical thinking skills. If we all were efficient critical thinkers, we would have the skill to evaluate our learned daily patterns or information given to us. Thinking critically, we are able to get to clearer fact-based conclusions on what we believe and make connection to where our values lay. Mastering a skill to think and evaluate information is not the only thing needed for us to change our ways, but it sure is an efficient way to start.

Children are like sponges, collecting a huge amount of information every day. There is no time like early childhood, where human would be developing socially, physically and mentally in such a fast pace (Koivula, Siippainen & Eerola-Pennanen 2017). This tells us that mastering various skills is what comes naturally to children. If we pay attention to teaching about criticality through education, children will develop a good basis to make connections and evaluate information on their own. A basis for the curricula in early childhood education and care is found in **National core curriculum for early childhood education and care (2018)**. It is issued by the Finnish National Agency for Education. This document is used to prepare and develop local curricula, containing aims for education and pedagogical framework to support the planning and implementation of early childhood education.

Critical thinking skills are highlighted as a thinking and learning skill which should be supported by early childhood educators. Gathering information, structuring, and creating something new are seen as things which require creative thinking, as well as critical thinking. Child's mind and learning is seen to develop by varied and meaningful experiences. Through education and care, children are guided to form their own opinions, evaluate dominating thinking patterns and act in ethically sustainable matter (Varhaiskasvatussuunnitelman perusteet 2018, 23-24.)

In this thesis, I am going to be examining methods used in early childhood education in

regards of developing critical thinking. The purpose is to use a literature review to find and analyze various efficient methods in early childhood education which support child's critical thinking skills. Firstly, I will explain the key concepts, and introduce the theoretical framework of early childhood education, critical thinking and developmental psychology. Secondly, I will explain the method used and introduce my research questions. Lastly, I will gather the results and conclude my findings and thoughts.

## 2 Theoretical framework

In this chapter I will explain the key concepts from the research questions. I have studied the needed theoretical material and will now explain the concept of early childhood education and which regulations guide the early childhood education in Finland. Since my research will be focused on early childhood education, it is important for me to have a broad understanding on it. Secondly, I will introduce theory on critical thinking and go more in-depth to the well-known theory by Harvey Siegel. This theory base will help to understand and analyze how various methods used in early childhood education affect the development of critical thinking. Lastly, I will go introduce theory on cognitive development to deepen the understanding on how child is believed to learn and develop. This will give me the ability to examine the literature review data later with a more comprehensive understanding of child's development. All the theories which I will introduce have been chosen based on their influence on Finnish early childhood education or education field in general.

### 2.1 Early Childhood Education

In this thesis, I will be focusing on early childhood education in Finland. To be able to answer my research questions, it is crucial to understand the concept of early childhood education and which regulations guide it. I will firstly introduce the formation of early childhood education and then move on to introducing the National core curriculum for early childhood education and care.

#### 2.1.1 From "daycare" to early childhood education

Early childhood education in Finland today is widely spoken but still a rather new concept, and it might not be a clear one for all. The journey for early childhood education in Finland has been a long development process, which has been affected by various changes in our society. The early stages can be traced back to time after wars when building our new society began. Many changes affected our societal patterns once the formation of welfare state started. People began to move to cities and the employment of women grew drastically.

Since it started to be more common for both parents to be working, a daycare system was developed. A new law to guide daycare system was placed; Act for children's daycare 36/1973 (Opetus- ja kulttuuriministeriö 2014.) Just like the name itself refers to, the daycare law was mainly thought to be a support for the working parents, rather than support for the children's development. After the change to early childhood education (ECEC) we have moved away from the concept of daycare (Hoivanet 2021.)

With the support of various studies, it has been showed that importance of ECEC is obvious. Changes have had to be made, to make sure we are putting children's needs first. Focusing on early childhood educators and their high-quality training has been a change prompted by the new act on early childhood education (540/2018). By this, trustworthy, competent educators with a pedagogical knowledge and the skills to support children are ensured (Opetus- ja kulttuuriministeriö 2018.)

Instead of just caretaking, ECEC consists of three elements: Educating child on values and norms, teaching basic skills as well as taking care of child's basic needs. Early childhood education is systematically planned and depending on child's age, these three elements are altered to form a comprehensive plan to respond child's needs. A big part of a one-year-old child's plan consists of care taking, whereas a six-year-old child's plan is more emphasized on education. Still, all these elements are important in early childhood, even though education is not emphasized with a one-year-old, this element should not be disregarded (Hoivanet 2021.)

Early childhood covers the ages from 0 to 6 and every child has the right to receive early childhood education. However, child's guardians make the decision, if and which form of ECEC their child receives. ECEC can be received in kindergarten, family daycare or as an open early childhood education activity. ECEC means a systematic and goal-oriented combination of education and care, highlighting pedagogy. Child's needs for support will be evaluated and co-operation between professionals from various fields is used to organize the needed support (Opetus- ja kulttuuriministeriö 2018.)

Early childhood education forms a big part of Finnish schooling system and is guided by National core curriculum for early childhood education and care. It is a national regulation issued by the Finnish national agency. The main goal for this regulation is to guarantee a more equal basis for all the children and also act as a supporting system for the guardians. National core curriculum for early childhood education and care is developed on the basis of the new act on early childhood education, which sets goals and provides the knowledge on children's right for early childhood education (Varhaiskasvatussuunnitelma perusteet 2018, 7.)



### 2.1.2 National core curriculum for early childhood education and care

National core curriculum for early childhood education and care (National core curriculum for ECEC) is a three-level structure which is a formation of the national core curriculum for ECEC united with the local curricula for ECEC and child's individual ECEC and care plans. Organizations in early childhood education are guided by National core curriculum for ECEC, and both *organizations* and *National core curriculum for ECEC* are guided by the following:

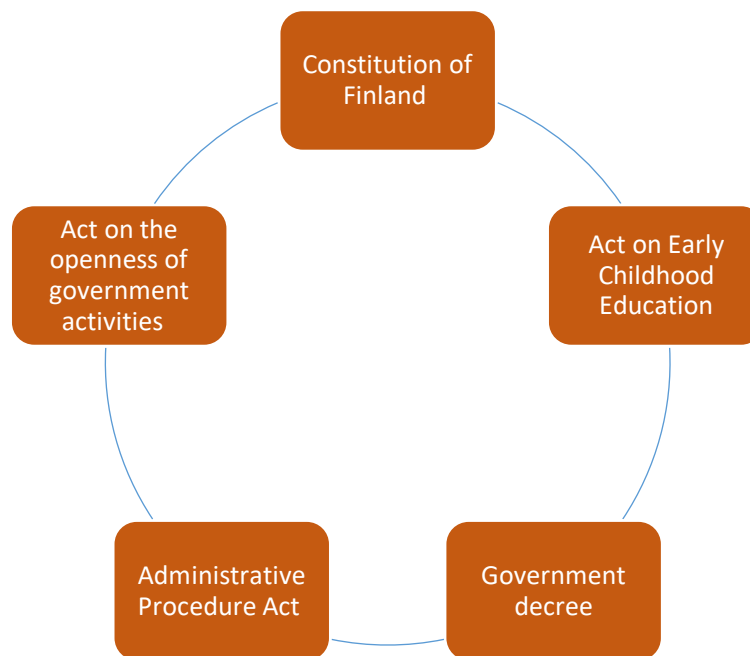


Figure 1 Guides for organizations and National core curriculum for ECEC (Based on National core curriculum for early childhood education and care 2018.)

National core curriculum for ECEC is a comprehensive guideline for early childhood education, holding in the mission and general goals, the development of the operational culture and the principles guiding it, the framework for pedagogical activity and principles which guide the provision of support. The general goals are to promote and support child's development and well-being, provide equal and versatile pedagogical environment and activities and ensure child's and the child's guardians participation. ECEC is thought to form a foundation for the child's learning and development in the future. Child is the primary consideration, and the

guidelines are built around that (National core curriculum for early childhood education and care 2018.)

National core curriculum is a baseline for creating the local curricula and child's individual ECEC plan. Local curricula's development is mandatory. Curricula guides the organizations in early childhood education in local level. Special needs locally should be taken in consideration when forming the local curricula, as well as participation opportunity for child, child's guardians, and personnel of ECEC. Individual plan is prepared for each child, and it is based on child's individual needs (National core curriculum for early childhood education and care 2018.)

National core curriculum for ECEC (2018) names the following as the five interconnected transversal competence areas:

- Thinking and learning
- Cultural competence, interaction, and self-expression
- Taking care of oneself and managing daily life
- Multiliteracy and competence in information and communication technology
- Participation and involvement

Transversal competences start to develop in early childhood and keep growing throughout life. Knowledge and skills are a part of these competences and they're guided by child's formed values and attitude, and will to take action. To strengthen child's competences, pedagogical activities are needed. A guiding framework has been provided in National core curriculum for ECEC (2018) for the planning and implementation of pedagogical activity:

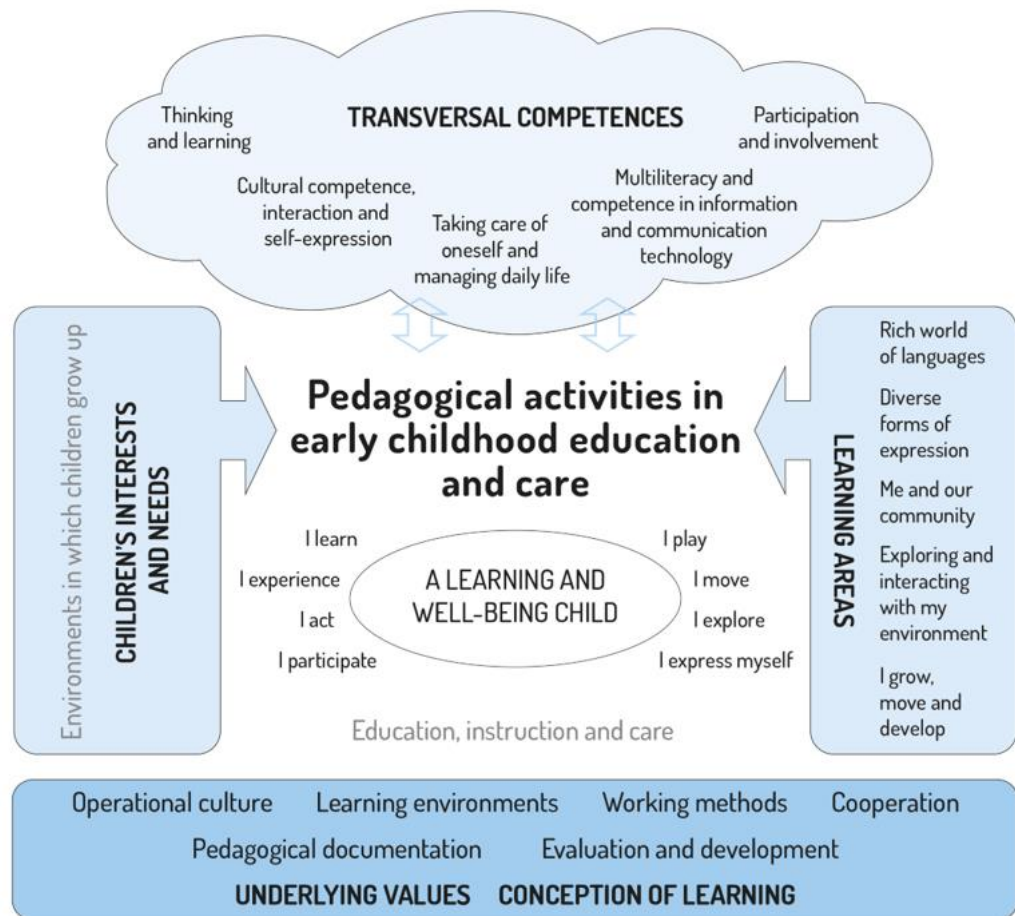


Figure 2 The framework for pedagogical activity (Based on Varhaiskasvatussuunnitelman perusteet (2018), adapted from Hyvinkää's curriculum for early childhood education and care 2019, 18)

The framework is a holistic approach, which ties together the transversal competences, learning areas, underlying values, conception of learning and holds the child as an active and capable learner, keeping the child's interests and needs in a high value. The framework supports goal-oriented pedagogical activities (National core curriculum for early childhood education and care 2018.)

## 2.2 Critical Thinking

The next concept I will introduce is critical thinking. Like mentioned in the introduction of this thesis, critical thinking skills should be supported by early childhood educators according to the national core curriculum of ECEC. Children should be encouraged to ask questions and question the answers they are given. According to the national core curriculum of ECEC

interaction with others and interaction with the environment forms the foundation for a child to develop thinking skills. Media criticality is also raised to be an important skill to learn, and the accuracy of things found online should be discussed with the child (Varhaiskasvatussuunnitelman perusteet 2018, 23-45.) In order to gain a deeper understanding of critical thinking, I will introduce some of the well-known theories. Critical thinking and its development can be viewed in the eyes of philosophers or psychologists (Lewis & Smith, 1993). In this chapter, I will cover critical thinking from the philosopher point of view. I will briefly explain the origins, and then move on to introduce Harvey Siegel's ideology of critical thinking more in depth.

### 2.2.1 Critical thinking in philosophers' eyes

Critical thinking and criticality may have a negative ring to it, but it surely is not done in negative intentions. According to McKean (2015, 451) critical thinking origins can be traced back to early Greek philosophy and language. The word critical comes from a word "kritikos" and the definition of criticality is strongly attached to ideology of reasoning and making good judgements (Beyer 1995; Lipman 1991). Psychologist, philosopher, and the father of modern-day critical thinking John Dewey defines critical thinking as following: "*Active, persistent, careful consideration of a belief or supposed form of knowledge in light of the grounds that support it and the further conclusions to which it tends*" (Dewey 1933). This quote refers to critical thinking as a tool to explore and explain one's beliefs by leaning on facts. Critical thinking is seen as an asset and important developing target in the education field. However, there are mixed opinions amongst educators on the definition and development of critical thinking (Horvath & Forte 2011.)

To form an understanding of varying views, critical thinking can be looked through five well-known philosophers' eyes and their ideology: Robert Ennis, Richard Paul, John McPeck, Harvey Siegel and Jane Roland Martin. There are some differences in the discussion about criticality and what makes an efficient critical thinker. Some ideas suggest that the most important way to look at critical thinking is seeing criticality as a skill, which should be learned and developed. Some on the other hand emphasize criticality as a character trait or just knowledge on particular topic. Amongst these philosophers Ennis and Paul gravitate towards skills for critical reasoning, McPeck to particular discipline and thorough knowledge on topic.

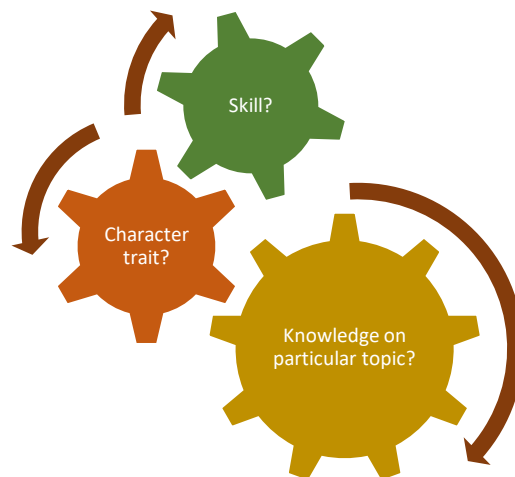


Figure 3 Philosopher theories on critical thinking

Out of these five philosophers Harvey Siegel believes in the importance of having the skill to think critically, as well as having the right attitude and the will to do so. Siegel is seen as a modernist educator, trying to redefine critical thinking skills (Mason 2008.) Siegel has also raised the importance of teaching critical thinking in the educational field (Siegel 1988). Due to this and his comprehensive view on the formation of critical abilities, I have chosen to use the Siegel’s theory as a baseline to introduce the core critical thinking skills.

### 2.2.2 Harvey Siegel & critical thinking

Harvey Siegel sees critical thinking and rationality as the main focus of education. Siegel believes that children are rational beings who should be allowed to ask a lot of questions and have the freedom to be critical. Educator should encourage children to ask questions and critical thinking should be accepted as the educational equivalent to rationality, and guide all the educational decisions (Siegel 1988, 86-87.) Siegel believes that a critical thinker can analyze information and evaluate why this particular information is better than some other, and whether it is based on facts and science. This however is not the only criteria for an efficient critical thinker. Also interest in evaluation and appreciation to good arguments is seen as qualities of critical thinker. In addition to these also distinct character traits are needed (Bailin&Siegel 2003, 183.)

Harvey Siegel has named his definition of critical thinking “Reasons conception of critical thinking”. This theory believes a critical thinker is appropriately moved by reasons. (Siegel 1988, 2). This definition highlights the bond between rationality and critical thinking as well as attitude, character traits and habits which drive one’s actions. These are the things Siegel

believes are crucial to develop in educational field, thinking skills and lasting tendencies of action which he categorizes as character traits. Skills that should be focused on are gathering and analyzing relevant data and molding the cognitive processes towards critical spirit. As a conclusion, his belief of critical thinking is built of components: Reason assessment and critical spirit (Siegel 1988, 41.)



Figure 4 Components of critical thinker (Based on Siegel 1988)

Reason assessment means the skill to understand the principles to evaluate reasons and the skill to use these principles accordingly. Siegel believes there are two types of principles: Subject-specific and Subject-neutral. Siegel believes that both types are needed to think critically. Subject-neutral principles can be applied to many different contexts, whereas subject-specific apply to restricted domains. Critical spirit is important to have, and Siegel believes that even with reason assessment, it is not enough without critical spirit. Even though someone has the ability to think critically, they might not use their skills if they do not have the willingness to use their skills. This would make them a non-critical thinker (Siegel 1988, 34-39.)

### 2.3 Developmental psychology

In the last chapter I went through the ideology of philosopher Harvey Siegel. In this chapter I will introduce developmental psychology to get a more comprehensive view on cognitive processes and therefore how critical thinking skills are seen to develop in the eyes of

psychologists. It is important for me to have understanding on how the development of a child is viewed today in early childhood education field, how our views have formed and through that understand how early childhood education can support the development of a child. Our views on child development, and therefore the early childhood education as well, has been molded by multiple developmental theories in the field from well-known psychologists like Freud, Erikson, Piaget, Watson, Skinner and Bandura. These developmental theories from abroad have influenced drastically ideologies in Finland (Lehtinen & Kuusinen 2001, 252). If we take a look at the National core curriculum of ECEC, we can find emphasis on environment, social interaction and sensory exploration which are also some of the main themes found in theories from psychologists mentioned earlier. Thinking and learning skills are seen as areas in child's cognitive development (MLL 2021). Since the aim of this thesis is to answer research questions regarding the development of a child's thinking skills, I will be focusing on cognitive development.

Human development has been approached from a various point of views by multiple developmental psychologists. Cognitive theories have evolved based on the thought that human's do not develop just by responding to environmental stimuli, unlike suggested by behaviorist theories for example. Learning is an occurring process through our mind and thoughts, and the cognitive developmental theories aim to explain these learning processes. One of the central views in cognitive theories is that human is seen as an active being, who is prompted by environment and able to process information and set goals to themselves. The information which human has already gained is guiding their actions. New experiences and exploration lead to learning which is based on the already gained information (Lehtinen & Kuusinen 2001, 83-86.)

Child's cognitive development theories often see development as gradually evolving. However, even though gradual theories are common, the main idea with these theories varies. As an example, we can look at the three most well-known cognitive developmental theories: Piaget's cognitive developmental theory, Vygotsky's sociocultural theory and information-processing theory (Richardson & Richardson 1998). The core ideas are that child develops by exploring and interacting (Piaget), by social interaction (Vygotsky) and by processing information, rather than just responding to stimuli (information-processing) (Lehtinen & Kuusinen 2001, 94-124).

Lehtinen & Kuusinen (2001, 258) points out the influence Piaget and Vygotsky has had on developmental psychology in Finnish educational field. Piaget's cognitive development stages are visible in various Finnish literature material, and it has been connected with Vygotsky's ideology to get a more comprehensive outlook on development. Also, Hujala & Turja (2011, 21) point out the fact that early childhood education has been based on Piaget's constructivist theory and Vygotsky's cultural-historical theory. I have chosen to introduce both of these

theories to get a comprehensive look on what our early childhood education has been influenced by.

### 2.3.1 Piaget & cognitive development

Jean Piaget was one of the most influential developmental psychologists in the 20<sup>th</sup> century. He was very fascinated on how mind develops and the structure of human's thought process (Rauste-Von Wright, Von Wright & Soini 2003, 158.) His work therefore can be seen as his attempt to create a comprehensive theory for knowledge and development. His constructivist theory is a creation reflecting this attempt; He brought together individual's intellectual structures which develop through experiences, biological structures and social intellectuality and made a theory on how these develop together in a constructivist process (Lehtinen & Kuusinen 2001, 110.)

In addition to these three classical factors to child's cognitive development, Piaget believed in "balance" which is a fourth factor. The theory behind Piaget's balancing factor helps to explain the interaction and development between the other three factors (Lehtinen ym 2001, 111.) Even though Piaget did pay attention to social influences, he did not believe it to be as important as genes and balancing process in the cognitive equilibrium. He believed that the balancing process happened through accommodation and assimilation. Assimilation means attaching new information to the already known. Accommodation however means the process of new information making changes to our old knowledge and forming new views through that (Rauste-Von Wright ym 2003, 25.)

Piaget's developmental stages are well-known and reflected in our developmental psychology field today. It is good to address the fact that there has been criticism towards his theory for disregarding the influence of culture and thinking of development in an overly systematic manner, with strict developmental stages. His theory has since been modified to different directions. Piaget's developmental stages are biologically defined stages, consisting of sensorimotor stage, preoperational stage, concrete operational stage and formal operational stage. Each of these stages are seen to be a time for child to construct their thoughts on reality. Once child moves on from one stage to another, they leave behind different stage restrictions (Lehtinen ym 2001, 116-117; Rauste-Von Wright ym 2003, 158.)



Sensorimotor (0-2 years old)	Preoperational (2-7 years old)	Concrete operational (7-11 years old)	Formal operational (11 years old and older)
<ul style="list-style-type: none"> <li>• Child is seen to develop through sensorimotor experiences. Since child is not able to move, their only way to discover world is to rely on their sensory experience through their body.</li> </ul>	<ul style="list-style-type: none"> <li>• Child's mind develops strongly through experience. Piaget believes that high functioning mental processes, such as logical thinking is not possible yet in this stage. Egocentric thinking is still very present, meaning children are not able to see that other people have different perspective on things comparing to their own view.</li> </ul>	<ul style="list-style-type: none"> <li>• A complete turning point for child's thinking. Child is finally able to form logical thinking processes and consider other people's perspective.</li> </ul>	<ul style="list-style-type: none"> <li>• From this point on, an ability for more abstract thinking and their problem-solving skills become more efficient</li> </ul>

Figure 5 Piaget's developmental stages (Lehtinen ym 2001, 116-117)

Piaget believed strongly in his developmental stages, and he believed the development to go through the stages without being influenced by environment or culture (Rauste-Von Wright ym 2003, 25). This takes us to looking at our other cognitive theory; Vygotsky's cultural-historical theory. Even though there are differences in the views of Piaget and Vygotsky, we can also find some similarities. In the next chapter I will introduce Vygotsky's views and his theory on zone of proximal development, which shows some resemblance to Piaget's assimilation and accommodation theory (Lehtinen ym 2001, 124.)

### 2.3.2 Vygotsky & cognitive development

Lev Vygotsky is one of the present-day forerunners on scientific views on human. His work has aimed to study how child learns to understand the world they live in (Rauste-Von Wright ym 2003, 32.) Like mentioned in the earlier chapter, Vygotsky has a strong belief on cultural factors being a great influence on development. In addition to culture, environment in general, social interaction and language are the main factors in his eyes (Lehtinen ym 2001, 121).

Vygotsky's views have been associated to have formed the social development theory, which holds his ideology of the development of a child's language and thought processes. He believes that language starts developing first as a tool to communicate and later on as a tool to support thinking (Vygotsky 1979.) In Vygotsky's cultural-historical theory, language is seen as the most influential factor to mold the understanding of a culture. Vygotsky's essential idea is that children learn and develop by understanding and participating in their social environment, and language is a key tool to be able to do so. From Vygotsky's ideology we have gotten the sociocultural theory, which shows that learning is formed through shared cultural

norms and values during interaction between child and the educator. With his cultural-historical theory, one of the key concepts is the zone of proximal development (Lehtinen ym 2001, 122-123.)

The zone of proximal development (ZPD) analyzes the relationship between a child and their social environment and how that relationship affects child's development. Vygotsky was keen on finding out how teaching affects the development of a child. The zone of proximal development holds the same ideology as Piaget's developmental stages, in the way that teaching needs to happen respecting child's biological processes. (Lehtinen ym 2001, 122-123.) The ZPD is the area of learning which includes the skills already known and skills which can be used with assistance. It is believed that targeting learning within this zone, helps child to develop new skills and function on their own with the same tasks they needed assistance for before (Rogoff 1990.)

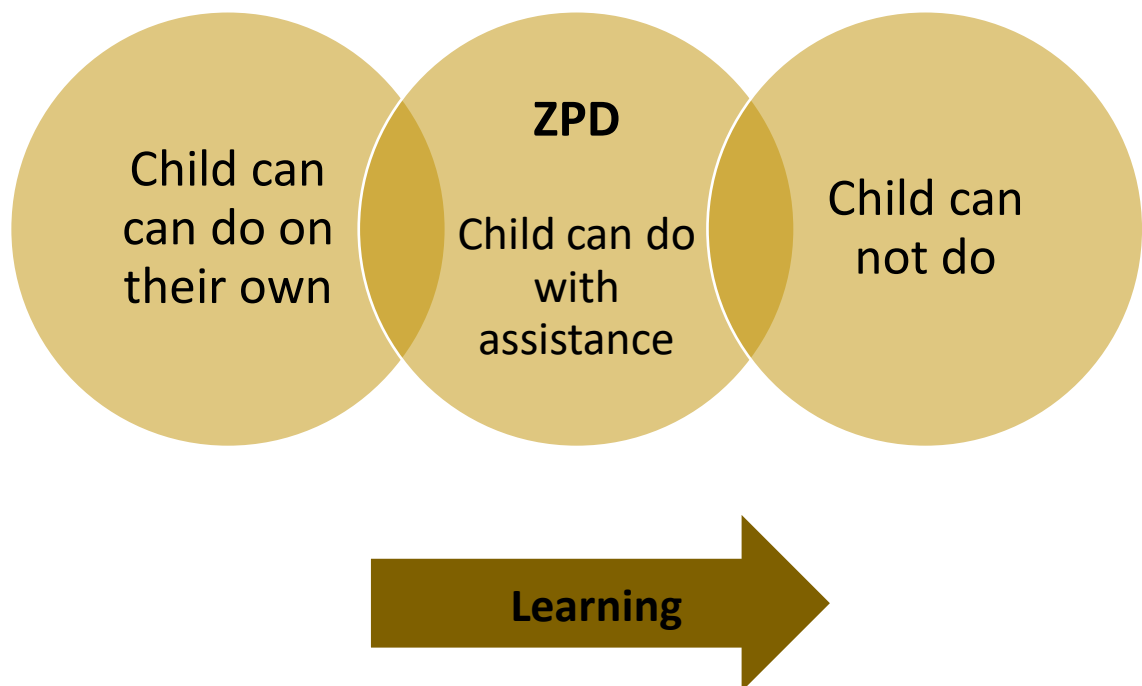


Figure 6 Vygotsky's zone of proximal development (ZPD) (Based on Rogoff 1990)

Vygotsky and Piaget have influenced our views on development today. However, their theories are not fully used as they were originally formed. Since then, their theories have been expanded and modified (Lehtinen ym 2001, 125.) This is good to keep in mind when looking into child's development through developmental psychology.

### 3 Methodology

In this chapter I will explain the methodology of this thesis. Firstly, I will introduce the research questions. I will explain the concept of literature review and literature search, which will be used as the research method. I will then move on to explain the inclusion and exclusion criteria, the data search process and how the data will be evaluated with qualitative content analysis. The trustworthiness and ethical issues regarding this method and data collection will be the last thing covered.

#### 3.1 Purpose, Aim & Research questions

The aim of this thesis is to find out how the development of critical thinking can be supported in early childhood education. To find answers to this, I have formed the following research questions:

1. How is it possible to support the development of critical thinking skills amongst children within the age of 0-6?
2. Which methods adapted to early childhood education support the development of critical thinking?

#### 3.2 Literature review

A literature review is an academically used method for independent research which can be used to collect data of a chosen topic (Kangasniemi, Utriainen, Ahonen, Pietilä, Jääskeläinen & Liikanen 2013). The data will be collected from existing research. Even though literature review is based on earlier research and conclusions, by no means does it mean that literature reviews would just be listings of these conclusions. A successful literature review includes criticality of found data and finding a connection between different research (Salminen 2011, 5-10). In addition to finding a connection between research, literature review is also a way to find differences, conflicts and insufficiency in the existing data (Hirsjärvi, Remes & Sajavaara 2004, 114).

There are also other reasons to execute a literature review, such as analyzing and developing new theory leaning on to the existing material, building an understanding of a broad topic, recognizing issues, and following a development pattern regarding the studied subject (Baumeister & Leary 1997, 312). There are three forms of literature review: descriptive, systematic & meta-analysis. The most suitable method for one's research should be chosen

depending on how thoroughly the topic needs to be investigated (Salminen 2011, 5-10).

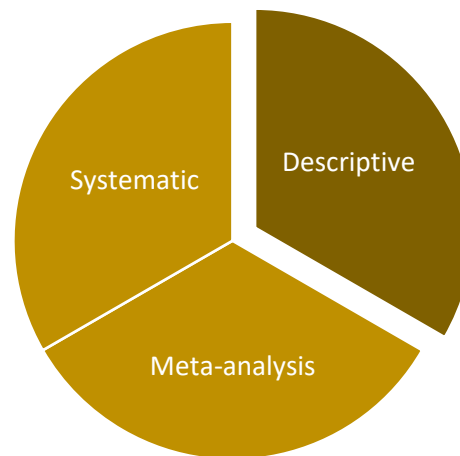


Figure 7 Forms of literature review (Based on Salminen 2011, 5-10)

Because this is a bachelor thesis, I will be doing a descriptive literature review. There will be systematic elements in the data collection process since it is done in clear systematic manner, and a great amount of literature material will be familiarized with. To keep data collection systematic, it is important to have a clear exclusion and inclusion criteria and keep a clear record of the data collection to ensure the traceability (Johansson 2007, 3-6.) I will introduce my exclusion and inclusion criteria later.

A descriptive review is one of the most used out of all three methods, and very common in healthcare field. Its nature is more of a superficial research, without strict rules on the material and research questions, and it is criticized for that reason. Because this method is more commonly known as an overview of research, it is speculated that there is a greater chance for data collection to be influenced of one's preferences and subjective view, which might always lead the research in a different direction (Kangasniemi & alii 2013, 298.) This means that the accuracy of the results might not be as trustworthy or precise as a more in-depth review would be. However, descriptive review is an effective way to get a broad view and understanding on the topic (Salminen 2011, 6.)

Kangasniemi ym. (2013) divide the execution process of descriptive literature review in four parts. The first part includes setting the research questions to guide the research. With too narrow research question there might not be enough data to execute research on, and too broad question will develop a problem with the material being too broad as well. This is why test researches are suggested to form suitable research questions (Niela-Vilen & Hamari 2016, 24-25.) The second part includes the literature search part. When doing a descriptive

literature review, the systematicity in this part is not as strict (Kangasniemi ym. 2013.). To gather the most useful and accurate literature material, inclusion and exclusion criteria must be decided. These should be formed based on research questions. Once literature search has been done, material should be reviewed by title, abstract and the whole text (Stolt & Routasalo 2007, 59.) Third part includes building an analysis. The aim is to answer the re-search questions, with analyzing and connecting the found data critically. Lastly as the fourth part, results are examined (Kangasniemi ym. 2013.)



Figure 8 Process of descriptive literature review (Based on Kangasniemi ym. 2013)

### 3.2.1 Inclusion & Exclusion criteria

Like mentioned in the earlier chapter, according to Kangasniemi ym. (2013) an efficient literature search process requires inclusion and exclusion criteria. Before deciding the criteria for my research, I made test searches. This allowed me to form an understanding, which search words would provide the best results for my research questions. I was also able to see whether enough research had been made about the chosen topic.

For me, it was clear that one of my search words would be “critical thinking”. However, during my test searches I also tried to use “creative thinking”, since I had seen it in some literature materials about critical thinking before. I was debating whether to use “early childhood education” or just “early childhood” as my other search word. Since my other research question can be answered without research on early childhood education perspective, I chose to use “early childhood” as my other search word. I also noticed that this search word gave me plenty literature material about research done in early childhood education, so I would also be able to answer my second research question.

I chose my databases based on my test searches and the Laurea University of Applied Sciences license. Ebook central, EBSCOhost combined, Finna, Google scholar, Proquest central and ScienceDirect (Elsevier). Ebook central has over 200 000 electronic books, with big quantity of English research material from various branches of sciences. EBSCOhost and Sciencedirect (Elsevier) holds a great number of articles also from various branches of science, one of them being healthcare. Proquest Central is a bit more versatile with its differing scientific material; over 8000 whole text magazines, video material and information of various companies. Finna is a database which holds material from Finnish universities and libraries (Laurea Libguides 2021.) Google scholar is a free database which holds a wide variety of different scholarly articles like articles, books and theses (Google scholar 2021).

Below I have formed a figure of my final search terms and databases.

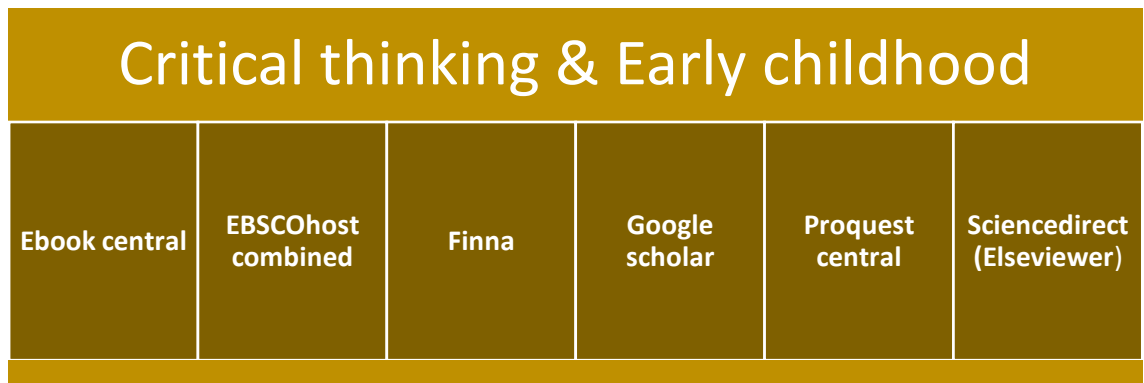


Figure 9 Search terms and databases

After my research questions were formed and test searches done, I moved on to forming my inclusion and exclusion criteria. The inclusion criteria which I wanted to have in my research were: suitable for my research questions, material published after 2015, English or Finnish language and full text should be available. Exclusion criteria therefore included: does not include needed data to answer my research questions or does not include the correct search terms, older than 2015, unknown language, no full text available. Below I have formed a figure of my inclusion and exclusion criteria.



	CHILD- HOOD	CHILD- HOOD	CHILD- HOOD	CHILD- HOOD	CHILD- HOOD	CHILD- HOOD	
Search results after adjustments	0	95	0	23	41	6	165
Title narrowing	0	15	0	7	6	2	30
Read full text	0	5	0	4	3	2	14
<b>Used in thesis</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>5</b>

Figure 11 The data search process

The chosen databases gave me differing results. From Ebook central and Finna I was unable to find anything after test searches. EBSCOhost and Proquest however gave me a good amount of research material. Once I adjusted my search, I ended up getting 165 results. It still seemed like a grand amount of material, but I did not think there would be a way to change my search without losing potential research articles. I then decided to go through the results and narrow down the results according to the most suitable titles for my research. This left me with 30. I then chose the most suitable ones after reading all the abstracts. I read a total of 14 full texts, and out of these I ended up with my 5 chosen researches.

I was happily surprised how much material could be found on the topic, since before my test searches I was a bit uncertain. Not only was I able to find multiple suitable articles and had a bit of a struggle choosing, but I was also pleased to notice the varying points of view on the topic. I will now introduce the chosen material.

First chosen research was written by Fernández-Santín & Feliu-Torruella and published in 2020. The title of the research is “Developing critical thinking in early childhood through the philosophy of Reggio Emilia”. The research is a design-based research of a qualitative study. The focus is to analyze Reggio Emilia pedagogy in early childhood and primary education



setting and show its usefulness in the development of critical thinking. The main findings showed that critical thinking should be developed through Reggio Emilia approach and playing from an early age, and art is seen as a great tool for children to express themselves, rethink and be more innovative which helps their thinking skills.

Second chosen research was written by Haryono, Wulandari, Eva & Anggraini and published in 2019. The title of the research is "Critical Thinking Skills and Self-Regulated Learning in The Learning Process in Early Childhood". It is a qualitative research using psychological studies with the purpose to analyze self-regulated learning, critical thinking skills, and learning in early childhood. The main findings were that students should actively be involved in learning process and more student-centered learning models should be used to develop critical thinking. The role of educators and education programs is highlighted in this research to be one of the crucial aspects influencing child's cognitive processes.

Third chosen research was written by Kim and published in 2017. The title of the research is "Transforming Music Education for the Next Generation: Planting 'Four Cs' Through Children's Songs". The four Cs stand for critical thinking, creative thinking, collaboration and communication, which are highlighted as essential skills to learn for the next generation. The purpose of this research was to analyze the learning processes of the four Cs and how the new standards announced by the National Association for Music Education in the USA in 2014 takes in consideration these learning processes. The main findings showed that music is an effective way for cognitive and social-emotional development, and lyrics can have an important role in children's thinking and learning.

Fourth chosen research was written by Aizikovitsh-Udi & Cheng and published in 2015. The title of the research is "Developing Critical Thinking Skills from Dispositions to Abilities: Mathematics Education from Early Childhood to High School". The aim of this research was to examine how teaching strategies oriented towards developing higher-order thinking skills influenced students' critical thinking abilities. The main findings show the importance of teachers, and systematic inclusion of CT oriented teaching. Adding mathematical problems to real-life problems was showed to increase the children's critical thinking skill development.

Fifth chosen research was written by Khalaily and published in 2017. The title of the research is "Facilitating the development of critical thinking skills and self-directed learning: An exploration of leadership and curriculum practice in a Palestinian kindergarten". The research was a qualitative case study investigating how educational leaders can help kindergarten children develop critical thinking and personal responsibility skills. The focus was on 3-5-year-old Arab children. The main findings showed that development of critical thinking should be more familiar for educators, there should be a curriculum for critical thinking training and

documentation of this development should be done.

### 3.2.3 Content analysis

I will be using content analysis as the method in this thesis. In this chapter I will introduce content analysis and how I will implement this method with the found data.

According to Tuomi & Sarajärvi (2018) content analysis is a basic method which can be used in all qualitative research. In literature review however, content analysis is only a way to organize data, not to a tool to analyze data. The actual research findings will develop after content analysis process is done and the analysis groups are analyzed with the help of reliable data. Content analysis process can be divided in three parts: simplifying, clustering and abstraction.

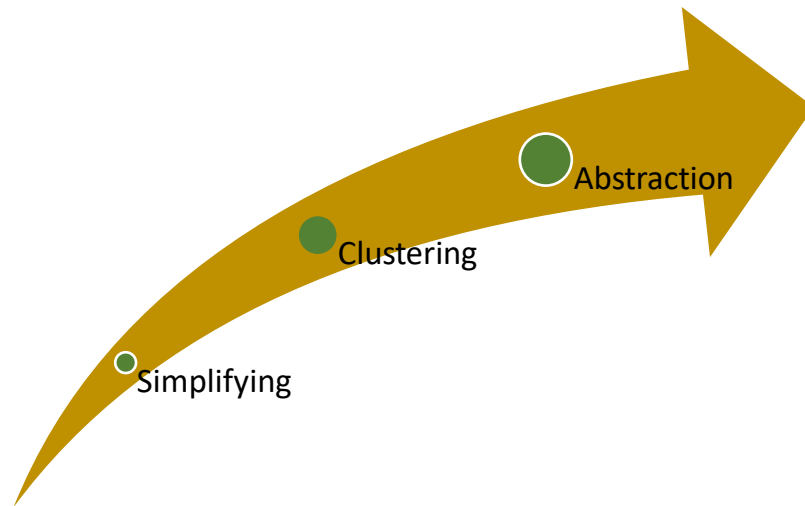


Figure 12 Process of content analysis (Based on Tuomi et al 2018)

Simplification means that you will leave out all the unnecessary details from collected data and make the important parts visible. I will demonstrate this by simplifying a sentence from one of my chosen research.

Sentence	Simplification
<p>“...The priority of the experiences are to stimulate the creativity of the students without restrictions so that they could think, experiment and draw conclusions</p>	<p>Critical thinking can be developed through stimulation of creativity.</p>

<p>freely in order to develop critical thinking...” (Fernández-Santín, M. &amp; Feliu-Torruella, M. 2020)</p>	
<p>“Early childhood teachers need to reflect critically about how to transform music education in their classrooms to realize the benefits of children’s experiences with music developing four Cs” (Aizikovitsh-Udi, E. &amp; Cheng, D. 2015)</p>	<p>Early childhood teachers have an important role making music education an effective tool to develop critical thinking.</p>

Figure 13 Example of simplifying

Once you have simplified data from your chosen research, you can move on to clustering, which is the second step. With clustering you will put in use the simplified data and divide it in groups of subclassifications, which I will again demonstrate in the following figure.

Simplifications	Clustering	Subclassification
<p>Critical thinking can be developed through stimulation of creativity.</p> <p>Curiosity supports the process of critical thinking.</p> <p>Humans are always motivated to think about things that are around them.</p>	<p>Creativity, curiosity, environment</p>	<p>Development of critical thinking in early childhood</p>
<p>Early childhood teachers have an important role making music education an effective tool to develop critical thinking.</p> <p>Critical thinking can be developed through the expression of the arts.</p>	<p>Music education, arts, documentation</p>	<p>Methods used in early childhood education which develop critical thinking</p>

Documentation is a necessary process of learning		
--	--	--

Figure 14 Example of clustering

Abstraction will be the last step of content analysis and it is the part where the clustered sub-classifications to main headings.

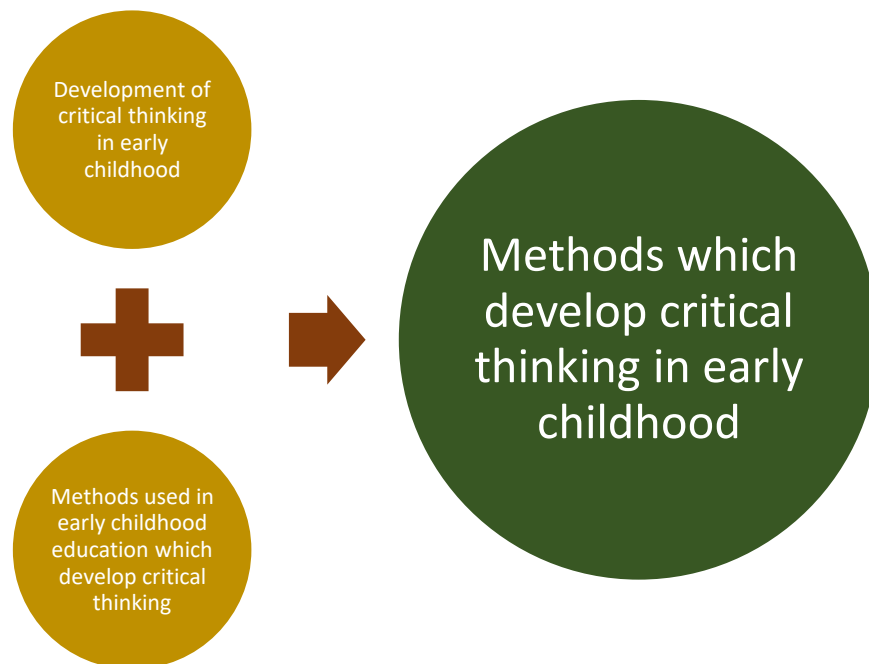


Figure 15 Example of abstraction

When starting my content analysis process, I was lucky to receive great tips from my fellow classmates who have went through content analysis for their previous literature reviews. I was recommended a color-coding method which turned out to make the process a lot clearer for myself. After familiarizing myself in-depth with the chosen data, I color-coded all the material which connected to development of critical thinking in yellow and all the methods used in early childhood education in green. After color-coding was done, I proceeded to simplifying phase.

Once I started the simplification process, I went through all the colored parts and simplified the sentences. I then moved on to clustering these simplifications to subclassifications and then decided the main headings. These main headings resulted in my abstracted heading which is methods which develop critical thinking in early childhood.

### 3.2.4 Trustworthiness & Ethical issues

According to Kangasniemi ym. (2013, 297) every step of literature review requires academic attitude. I have had this in my mind throughout the whole process and will now raise some thoughts on the trustworthiness and ethical issues regarding my literature review.

To conduct a trustworthy research, it is very important to make a thorough plan, execute the research according to the plan and log data search process clearly. Data search process should be explained from start to end, as clearly as possible, so the reader is able to understand how I have ended with the research results. This way results and their trustworthiness can be evaluated (Stolt & Routasalo 2007, 68.) In this thesis the literature search process was conducted in a systematical manner, which indeed allows reader to understand how the results were gotten. Before executing my search process, I made test searches so I was able to set my plan and reach the most accurate materials for this research. According to Flinkman & Salanterä (2007, 107) good-quality data is the way to ensure a good-quality research. When I was choosing the materials, one thing I paid attention to whether they were peer reviewed and well sourced.

If we take a look at the content analysis method, we may raise some points of ethical issues. There are clear steps to follow when doing a content analysis, however the results of the same topic research still vary. Choosing the articles and interpreting them requires one to go through thought processes which are influenced by beliefs and attitudes. This means that we may face issues regarding subjectivity. If someone else were to conduct a literature review on critical thinking in early childhood education, they might choose different data than I did and be influenced by their thoughts and beliefs when gathering the results. This is something to always keep in mind with content analysis.

One last thing that should also be pointed out, is the fact that all the literature material was in English. Even though I believe my language skills to be efficient enough to get a comprehensive understanding of the material, there is still a slight possibility for misunderstandings and wrongly interpreted data. In addition to the language issue, I want to point out the strict schedule which this thesis was conducted on, and the amount of time which was given to exploring the data. If I would have spent more time on the material, I might've gotten an even better understanding of the research data.

## 4 Research findings/Results

In this chapter I will introduce the results for my research questions. I have divided my research findings in two chapters which I formed during my content analysis process: Development of critical thinking and methods in early childhood. The aim of this chapter is to present

the analyzed data from these two subclassifications and get as comprehensive understanding on the methods which develop critical thinking in early childhood.

#### 4.1.1 Development of critical thinking

Critical thinking can be spotted already in early childhood, through the natural tendency to curiously explore things in the environment and try to gain understanding. The key characteristic in very early age is autonomy which allows children to explore their surroundings and develop their thinking. To support their natural tendency to explore and analyze, children should also be exposed and encouraged to important critical thinking skills from an early age, such as observation and questioning habits. Children's cognitive skills are developing very rapidly in early age, and their thought processes should be supported to develop in a direction of criticality (Kim 2017; Haryono et al 2019.)

There is no clear comprehensive list of critical thinking skills, which could be evaluated in children. However, Khalaily (2017) raises some mannerisms which can be spotted in children's behaviour and should be prompted, such as negotiation and ability to see that there are various perspectives, ability for looking for information, compare, and share it with others, engagement with problem-solving and evaluate themselves. Khalaily points out that these can be seen as successful outcomes of critical thinking, but also as ways to develop critical thinking. A great opportunity to observe these attributes is during play, when children are interacting and displaying their skills.

According to Haryono et al (2019) self-regulated learning is raised to be an effective way for critical thinking skills to be supported. Self-regulated learning is defined to be a process where child is an active participant by defining goals, controlling their learning experience, using resources efficiently and maintain positive emotions and staying motivated. It consists of self-control, self-discipline and self-direction and to foster the development of critical thinking, these attributes should be developed. Self-regulated learning is seen as a part of the cognitive process, which is supported by child's own curiosity. Children should also be encouraged to analyze and criticize, and through that develop their self-regulated learning. Also, Khalaily's (2017) findings showed that self-control and self-regulation have an effect on critical thinking. The goal is to push child to think on their own and have responsibility.

Amongst the chosen researches, creativity was raised to have an effect on the development of critical thinking and thinking processes in general. According to Kim (2017) exposing children to arts support the development of cognitive processes. Music experiences and other artistic education enhance children's cognitive and social-emotional development. The impact can be seen in children's long-lasting development, learning abilities and regulating emotions. Through musical activities children are required to put their creativity, which involves

imagining, creating and performing which are closely attached to critical thinking skills. Also, Fernández-Santín et al (2020) believe critical thinking is seen to develop by fostering children's creativity and curiosity. Seeing children as active learners facilitates the encouraging of critical thinking since children are constantly trying out new ideas. Discussion should be enriched by the environment and colourful opportunities.

#### 4.1.2 Methods in early childhood education

The early childhood educator has a great responsibility in adapting the right methods for child's critical thinking skill development. According to Khalaily (2017), the current training for kindergarten teachers is inadequate regarding critical thinking. More methods to reveal the thought processes should be adapted to early childhood education. This means that critical thinking should also be integrated to the curriculum and be thought as an educational goal. The personal characteristics of the teacher, teacher's vision on educational goals and how they choose to accomplish these goals have a great impact on the matter as well. Teachers should use asking questions as a tool to "feed" thinking processes and also give children time to go through those thinking processes. Maintaining a professional self-awareness to be able to evaluate their own influence on child and child's critical thinking skills are also important.

The same theme was raised in all of the chosen research. Early childhood educator has an important role with maintaining a fruitful environment for critical thinking skills to flourish. Kim (2017) gives an example of teacher encouraging children during musical activities by asking questions which force children to explain their actions and opinions. Fernández-Santín, M. et al (2020) give an example of educators having an important role choosing and planning activities which develop learning and at the same time foster the skills needed for critical thinking. Aizikovitsh-Udi & Cheng (2015) points out the importance of educators planning their classes so, that critical thinking is consistently and systematically encouraged. Haryono et al (2019) conclude in their research the cruciality of the educators' role, by involving children in the learning process and therefore supporting self-regulated learning process. This requires making the learning environment interesting and challenging enough for children.

Aizikovitsh-Udi, E. & Cheng, D. (2015) raise the idea of dispositions of criticality. Educational environment should be set to structured program which supports the development of critical thinking skills. Like already mentioned, educators have a great responsibility in making this happen. In the early childhood critical thinking dispositions can be developed by familiarizing children with simple approaches, such as using ways to express thinking processes by "I see..." or "I think...". These approaches can be integrated to activities in early childhood education. According to Kim (2017) music can be used as a tool to develop analyzing and evaluation skills, which are important parts of critical thinking. Just like Aizikovitsh-Udi et al (2015),

he also points out educator's important role with critical thinking dispositions by broadening the conversation by using questions and handing out suggestions if necessary. Examples of musical activities are expressing a meaning of a word through musical movement or conversations about what melody makes children feel. Educators are also able to deliver a message through songs and that way awaken children's thought processes.

Reggio Emilia philosophy also brings focus on art developing critical thinking. The key elements which Fernández-Santín et al (2020) list include for instance the environment as a third teacher, documentation and the hundred languages of the child. In Reggio Emilia, child and environment are seen as educators alongside the early childhood educator. Environment should be intriguing children to explore and experiment. Documentation facilitates a meaningful communication between educators, children and families, which allow educators to gain insight on children's thought processes and make their thinking visible for the children and parents. The hundred languages are a metaphor of the number of ways children can express themselves, broadening expression from verbal communication to things like visual arts, music, dance and play. Also, Khalaily (2017) agree that in early childhood education play is an important method to broaden child's thinking skills. During play children tend to test their thinking and communicate their thoughts to peers.

According to Aizikovitsh-Udi et al (2015) critical thinking can be fostered through mathematics which they see as an effective method starting from early childhood education all the way through high school and further. Providing students with tasks which activate their thought processes like comparing unfamiliar objects with characteristics of familiar objects. If educators systematically involve mathematical real-life problems for children and encourage to question and debate, children will develop habits which strive them towards critical thinking. Khalaily (2017) brings up a point of how critical thinking cannot be just verbally transmitted to children; children need to be active learners during the process. Linguistic mediation and learning by experience were raised as important components for the children's learning process. Methods which spark these components are questions to awaken critical thinking, allocation of time to think and peer assessment through mutual learning. These showed to be important tools to support children's cognitive processes.

#### 4.2 Discussion on findings

My five chosen research materials had all their own methods highlighted which were believed to support the development of critical thinking. Even though this was the case, all the materials had clear commonalities on basic skills which demonstrate the possible development characteristics. Because of the differences in methods, I was also able to get a broader perspective on my second research question about which methods used in early childhood education



are effective tools to support critical thinking. Therefore, I was able to conduct comprehensive data to answer both of my research questions. I will introduce the main findings of my thesis next.



Figure 16 Main findings

The first main finding of this study showed that critical thinking in fact is seen as a set of skills and attributes which can and should be developed. These attributes can be developed during various early childhood education activities as long as criticality is encouraged, and this way children's cognitive processes affected. Critical thinking can be encouraged by asking questions and therefore requiring child to explain their actions. To enforce the systematicity of learning early childhood educators should pay attention to providing an example of critical behaviour and the environment should be motivating children to explore and broaden their knowledge and thinking processes by experimenting.

The second major finding showed that there is a quite similar understanding of the development of critical thinking. Critical thinking is seen to live in children from a very early age through various attributes like curiosity and eagerness to find answers and explain their surroundings. It is important for early childhood educators to have the understanding of which characteristics form critical thinking and use that knowledge to prompt these characteristics in children. This way children form the needed mannerisms which are expected of efficient critical thinkers and these mannerisms will be strengthened even more if prompted throughout their life. This can be reflected to Harvey Siegel's ideology of reason assessment and critical spirit as a formation of critical thinker. The findings might suggest that children are

naturally critical spirited but their skills for reason assessment should be developed accordingly.

The third major finding showed the importance of the role of early childhood educator. The knowledge on critical thinking, what characteristics form a critical thinker, which methods in early childhood education are suitable for supporting the development of criticality and knowing their own role as a prompter of child's cognitive processes are all things which early childhood educator should be able to master in order to support the child on their path to being an efficient critical thinker. In the introduction of this thesis, I mentioned that the Finnish National core curriculum for ECEC brings up critical thinking skills and highlights them as a thinking and learning skill which should be supported by early childhood educators. In addition to early childhood educator's role, the findings of the literature review also pointed out that critical thinking should be thought as an educational goal and be built to the curricula. Early childhood educator should have the skill to analyze which methods are challenging enough to develop children's skills. For this my theoretical framework of Vygotsky's proximal zone of development might give a sense of understanding on child's cognitive learning and what educator should consider when choosing the most suitable methods.

Even though I am happy with the research material and the findings I was able to get, it is important to take in consideration the limitations. With only 5 researches analyzed, this research should be seen as an overview of the topic rather than a comprehensive study. The findings were analyzed with the theoretical framework built with the knowledge of few well-known theories from Siegel, Piaget and Vygotsky. These were carefully chosen based on their impact on educational field, however there are limitations to these theories. There is criticism raised on their lacking, and it is important to knowledge that due to that reason, these theories have been modified often from their original forms to make a more comprehensive theory. Also, it is important to knowledge the fact that the development of a child is influenced by many factors, and the evaluation of specific method and its influence is therefore fairly difficult.

The findings of the results are important to show that criticality should indeed be fostered already in early life, and it is important to support children in developing the needed characteristics. It is also important to recognize that there are multiple varying methods which we are able to use either in early childhood education or at home, to encourage children's critical thinking skills and critical spirit. So, the next time a child is asking many questions I will remember to be grateful for the questioning, it just shows the critical spirit in the child.

For further developmental ideas I would raise the question of bringing critical thinking more visible in early childhood education. Like mentioned, the National core curriculum for ECEC

does bring up critical thinking and the need for these learning skills to be supported. More concrete plans should be put in place. The characteristics of criticality should be clear, the emphasis on critical thinking when planning curricula should be kept in mind and having further discussions amongst early childhood educators on how this learning skill could be supported better.

I have been familiarizing myself with Reggio Emilia and think this pedagogy and its philosophy should be introduced more to early childhood education. It is clear that Reggio Emilia and arts are backed up with research on being efficient tool for the development of critical thinking. The key elements are lined up with the National core curriculum for ECEC and also foster child's cognitive processes and activeness with their own learning.

In the research material, I was unable to find points on children's varying developmental stages. How the methods used in early childhood education affect one child compared to another. Is there a big difference on methods and their effect on children's cognitive development? It is important to know how these methods vary amongst children in order to know which methods are the most efficient in early childhood education programs.

## 5 Conclusion

Now that my thesis process is coming to an end, I must say that it was not as intense as I was afraid it was going to be. I chose to do my thesis in a fairly strict schedule and during multiple other school projects and I do feel like I can be proud of the work I've put into this. It was easy to find motivation due to the important topic which I feel passionate about. In my opinion criticality and having an ability to reason our actions cannot be spoken about enough. We should talk more about the importance of developing the needed skills as early as possible.

The aim of the thesis was to answer my research questions "How is it possible to support the development of critical thinking skills amongst children within the age of 0-6?" and "Which methods adapted to early childhood education support the development of critical thinking?". I am happy to have found answers to my research questions. The major findings showed that critical thinking skills can be fostered within the early childhood education through various methods, such as arts, mathematics and encouraging towards self-regulated learning. Some of the key characteristics which should be encouraged amongst children are verbalizing their thought processes and absorbing information by questions and exploring.

What I have come to learn during this process is the importance of my role when working in the early childhood education field with children. My thoughts on learning *with* children, rather than teaching children have become even more important to me. It is crucial for early

childhood educator to be there to guide and broaden the learning. Especially after my thesis results it became clearer to me how important it is to support child's cognitive processes for example by having child explain why they chose to do something. However, to learn *with* children I should allow them to go through their thought processes and actions, encourage them to share it with others, and I should make sure that I have the knowledge and skills to support this process.

I found literature review to be a very pleasing research method. Before starting my thesis process, I got an overwhelming number of gasps and terrified looks on the chosen method. The main reason for that was the amount of literature I would have to go through and the unfamiliar process of the literature search and analyzing the content. My favorite part about this whole process was actually the systematic manner of how literature material was conducted, diving in the material and reflecting on those results. I am glad I chose to do this and can see myself using this method in the future.

As a learner I have come to understand, not only during my thesis process but also during my school years in Laurea, that I have a need to overachieve and put myself on ridiculous schedules without considering how it might affect my wellbeing. I do not have set plans on where I want to be in the future, but I do know that it is somewhere in the social work field. To be able to give the best of myself and feel good about the work I do, I need to stop pushing myself to the limit constantly. This spring of working full time and doing my schoolwork has proved that I have finally gotten my time management skills together, and like my fortune cookie fortune taped on my computer says: "Your ability to juggle tasks will take you far". I fully believe in that but a major improvement for this skill is to learn to appreciate the work I've done and understand the importance of rest. Life is not to be carried out like it was a task and my main goal from now on is to remind myself of this.

I appreciate everything my thesis process taught me about the theory base on early childhood education, critical thinking and cognitive development of a child. Due to the theoretical framework, I was able to analyze and understand the research data and the results in a more comprehensive way. It also resulted in evaluation of the accuracy of the chosen theories and thoughts on how they could be developed. The results of my literature search changed my perspective on how I see early childhood educator's role by gaining new understandings and strengthening old beliefs. I also gained more tools on working in early childhood education field, by learning about the methods mentioned in my results chapter. As a summary, this thesis was an overview and introduction to the topic of critical thinking and how it can be fostered in early childhood field. This was a valuable journey for myself and broadened my views on the topic. I hope it does the same for anyone reading this.

## References

## Printed

- Bailin, S. & Siegel, H. 2003. *Critical Thinking*. Kirjassa: Blake, N., Smeyers, P., Smith, R. & Standish, P. (toim): *The Blackwell Guide to the Philosophy of Education*. Blackwell Publishing.
- Beyer, B.K. 1995. *Critical Thinking*. Fastback vol 385, 7-33. Bloomington, IN: Phi Delta Kappa Educational Foundation.
- Dewey, J. 1933. *How we think: a restatement of the relation of reflective thinking to the educative process*. Boston: Heath and Company.
- Flinkman, M. & Salanterä, S. 2007. Integroitu katsaus - Eri metodeilla tehdyn tutkimuksen yhdistäminen katsauksessa. Teoksessa Kirsti Johansson, Anna Axelin, Minna Stolt & Riitta-Liisa Ääri (toim.) *Systemaattinen kirjallisuuskatsaus ja sen tekeminen*. Turun yliopisto. Hoitotieteen laitoksen julkaisuja. Tutkimuksia ja raportteja A:51/2007. Turku: Digipaino-Turun yliopisto, 84-108.
- Hirsjärvi, S., Remes, P. & Sajavaara, P. 2004. *Tutki ja kirjoita*. 10 painos. Helsinki: Tammi.
- Johansson, K. 2007. Kirjallisuuskatsaukset - Huomio systemaattiseen kirjallisuuskatsaukseen. Teoksessa Kirsti Johansson, Anna Axelin, Minna Stolt & Riitta-Liisa Ääri (toim.) *Systemaattinen kirjallisuuskatsaus ja sen tekeminen*. Turun yliopisto. Hoitotieteen laitoksen julkaisuja. Tutkimuksia ja raportteja A:51/2007. Turku: Digipaino-Turun yliopisto, 3-9.
- Kangasniemi M, Utriainen K, Ahonen S-M, Pietilä A-M, Jääskeläinen P & Liikanen E. 2013. Kuvaileva kirjallisuuskatsaus: Eteneminen tutkimuskysymyksestä jäsenettyyn tietoon. *Hoitotiede* 25(4), 291-301
- Kauppila, R.A. 2007. *Ihmisen tapa oppia*. PS Kustannus: Juva.
- Koivula, M., Siippainen, A. & Eerola-Pennanen, P. 2017. *Valloittava varhaiskasvatus: Oppimista, osallisuutta ja hyvinvointia*. Vastapaino: Tampere.
- Lehtinen, E. & Kuusinen, J. 2001. *Kasvatuspsykologia*. 1 painos. WSOy: Juva.
- Lipman, M. 1991. *Thinking in education*. Cambridge, UK: Cambridge University Press.
- McKean, E. 2005. *The New Oxford American Dictionary 2<sup>nd</sup> Edition*. New York: Oxford University Press.

Rauste-Von Wright, M., Von Wright, J. & Soini, T. 2003. Oppiminen ja koulutus. 9 painos. WSOY: Juva.

Richardson, K. & Richardson, D. K. 1998. Models Of Cognitive Development.

Siegel, Harvey 1988: Educating Reason - Rationality, Critical Thinking and Education. Routledge.

Stolt, M. & Routasalo, P. 2007. Tutkimusartikkelien valinta ja käsittely. Teoksessa Kirsti Johansson, Anna Axelin, Minna Stolt & Riitta-Liisa Ääri (toim.) Systemaattinen kirjallisuuskatsaus ja sen tekeminen. Turun yliopisto. Hoitotieteen laitoksen julkaisuja. Tutkimuksia ja raportteja A:51/2007. Turku: Digipaino- Turun yliopisto, 58-70.

#### Electronic

Aizikovitsh-Udi, E. and Cheng, D. 2015. Developing Critical Thinking Skills from Dispositions to Abilities: Mathematics Education from Early Childhood to High School. *Creative Education*, 6, 455-462. Accessed 20.5.2021. Available at: doi:10.4236/ce.2015.64045.

Baumeister, R. F. and Leary, M. R. (1997) 'Writing Narrative Literature Reviews', *Review of General Psychology*, 1(3), pp. 311-320. Accessed 10.5.2021. doi: [10.1037/1089-2680.1.3.311](https://doi.org/10.1037/1089-2680.1.3.311).

Efron, S.E. & Ravid, R. 2018. *Writing the Literature Review: A Practical Guide*, Guilford Publications, New York. Accessed 2.5.2021. Available at: ProQuest Ebook Central.

Fernández-Santín, M. & Feliu-Torruella, M. 2020. Developing critical thinking in early childhood through the philosophy of Reggio Emilia. Accessed 20.5.2021. <https://doi-org.nelli.lau-rea.fi/10.1016/j.tsc.2020.100686>

Google scholar. 2021. Accessed 18.5.2021. <https://scholar.google.com/intl/en/scholar/about.html>

Haryono, S.E., Wulandari, N.W., Eva, N. & Anggraini, H. 2019. Critical Thinking Skills And Self Regulated Learning In The Learning Process In Early Childhood. Accessed 20.5.2021. <http://fppi.um.ac.id/wp-content/uploads/2019/11/Proceeding-Seminar-Internasional2019.pdf#page=102>

Hoivanet. 2021. Mikä ihmeen varhaiskasvatus? Accessed 9.4.2021. <https://www.hoivanet.fi/blogi/mika-ihmeen-varhaiskasvatus/>

Horvath, CP, & Forte, JM (eds). 2011. Critical Thinking. Nova Science Publishers, Incorporated, Hauppauge. Accessed 10.4.2021. Available from: ProQuest Ebook Central.

Hyvinkää's curriculum for early childhood education and care. 2019. Accessed 3.5.2021. [https://www.hyvinkaa.fi/globalassets/kasvatus-ja-koulutus/varhaiskasvatus/vasu/hyvinkaan-varhaiskasvatussuunnitelma-2019\\_en.pdf](https://www.hyvinkaa.fi/globalassets/kasvatus-ja-koulutus/varhaiskasvatus/vasu/hyvinkaan-varhaiskasvatussuunnitelma-2019_en.pdf)

Kangasniemi, M., Utriainen, K., Ahonen, S-M., Pietilä, A-M., Jääskeläinen, P. 2013. Hoitotiede 25(4):291-301. Kuvailuva kirjallisuuskatsaus: eteneminen tutkimuskysymyksistä jäsenettyyn tietoon. Accessed 12.5.2021. <http://urn.fi/URN:NBN:fi:ELE-1614408>

Khalaily, M. 2017. Facilitating the development of critical thinking skills and self-directed learning: an exploration of leadership and curriculum practice in a Palestinian kindergarten. Accessed 20.5.2021. <https://derby.openrepository.com/bitstream/handle/10545/622009/Maysfinal.pdf?sequence=1&isAllowed=y>

Kim, J. 2017. "Transforming Music Education for the Next Generation: Planting 'Four Cs' Through Children's Songs", International Journal of Early Childhood, vol. 49, no. 2, pp. 181-193. Accessed 20.5.2021. Available at: DOI:10.1007/s13158-017-0187-3

Laurea libguides. 2021. A-Z Databases. Accessed 18.5.2021. <https://libguides.laurea.fi/az.php?a=e&t=8773>

Mason, M (ed.) 2008. Critical Thinking and Learning. John Wiley & Sons, Incorporated; Hoboken. Accessed 25.4.2021. Available from: ProQuest Ebook Central.

MLL. 2021. Lapsen kasvu ja kehitys. Accessed 24.4.2021. <https://www.mll.fi/vanhemmille/lapsen-kasvu-ja-kehitys/>

National core curriculum for early childhood education and care. 2018. Finnish National Agency for Education. Accessed 22.3.2021. <https://www.oph.fi/en/statistics-and-publications/publications/national-core-curriculum-early-childhood-education-and>

Opetus- ja kulttuuriministeriö. 2014. Varhaiskasvatuksen historia, nykytila ja kehittämisen suuntalinjat. Accessed 24.4.2021. <https://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/75258/tr12.pdf?sequence=>

Opetus- ja kulttuuriministeriö. 2018. Uusi varhaiskasvatuslaki: lapsen etu keskiöön, henkilöstön osaamiseen panostetaan. Accessed 9.4.2021. <https://minedu.fi/-/uusi-varhaiskasvatuslaki-lapsen-etu-keskioon-henkiloston-osaamiseen-panostetaan>

Razzetti, G. 2018. How to overcome the fear of change. Psychology Today. Accessed 22.3.2021. <https://www.psychologytoday.com/us/blog/the-adaptive-mind/201809/how-overcome-the-fear-change>

Salminen, A. 2011. Vaasan yliopisto - Mikä kirjallisuuskatsaus? Accessed 3.5.2021. [https://www.univaasa.fi/materiaali/pdf/isbn\\_978-952-476-349-3.pdf](https://www.univaasa.fi/materiaali/pdf/isbn_978-952-476-349-3.pdf)

Tuomi, J. & Sarajärvi, A. 2018. Laadullinen tutkimus ja sisällönanalyysi. Uudistettu laitos. Helsinki: Kustannusosakeyhtiö Tammi. Accessed 15.5.2021. Available at: Laurea finna.

Varhaiskasvatussuunnitelman perusteet. 2018. Opetushallitus. Accessed 19.3.2021. [https://www.oph.fi/sites/default/files/documents/varhaiskasvatussuunnitelman\\_perusteet.pdf](https://www.oph.fi/sites/default/files/documents/varhaiskasvatussuunnitelman_perusteet.pdf)



Figure 1 Guides for organizations and National core curriculum for ECEC (Based on National core curriculum for early childhood education and care 2018.).....	9
Figure 2 The framework for pedagogical activity (Based on Varhaiskasvatussuunnitelman perusteet (2018), adapted from Hyvinkää’s curriculum for early childhood education and care 2019, 18) .....	11
Figure 3 Philosopher theories on critical thinking .....	13
Figure 4 Components of critical thinker (Based on Siegel 1988).....	14
Figure 5 Piaget’s developmental stages (Lehtinen ym 2001, 116-117).....	17
Figure 6 Vygotsky’s zone of proximal development (ZPD) (Based on Rogoff 1990) .....	18
Figure 7 Forms of literature review (Based on Salminen 2011, 5-10) .....	19
Figure 8 Process of descriptive literature review (Based on Kangasniemi ym. 2013) .....	20
Figure 9 Search terms and databases .....	22
Figure 10 Inclusion and exclusion criteria .....	22
Figure 11 The data search process.....	24
Figure 12 Process of content analysis (Based on Tuomi et al 2018) .....	26
Figure 13 Example of simplifying .....	27
Figure 14 Example of clustering.....	28
Figure 15 Example of abstraction.....	28
Figure 16 Main findings.....	33

## Appendices

## Appendix 1: Data Matrix

Authors & Title	Year & Place	Purpose of the study
Fernández-Santín, M. & Feliu-Torruella, M. Developing critical thinking in early childhood through the philosophy of Reggio Emilia	2020. SPAIN	Recommendations of Reggio Emilia philosophy for early childhood education to develop critical thinking.
Haryono, S.E., Wulandari, N.W., Eva, N. & Anggraini, H. Critical Thinking Skills And Self Regulated Learning In The Learning Process In Early Childhood.	2019. INDONESIA	Study on self-regulated learning amongst children and how it fosters critical thinking skills.
Kim, J. "Transforming Music Education for the Next Generation: Planting 'Four Cs' Through Children's Songs", International Journal of Early Childhood, vol. 49, no. 2, pp. 181-193.	2017. USA	Analysis on the learning processes of critical thinking, creative thinking, collaboration and communication.
Aizikovitsh-Udi, E. and Cheng, D. Developing Critical Thinking Skills from Dispositions to Abilities: Mathematics Education from Early Childhood to High School. Creative Education, 6, 455-462.	2015. ISRAEL / USA	Demonstration of improvement in critical thinking skills due to mathematical methods used in education field.
Khalaily, M. Facilitating the development of critical thinking skills and self-directed learning: an exploration of leadership and curriculum practice in a Palestinian kindergarten.	2017. PALESTINE	How critical thinking and personal responsibility skills can be developed by educational leaders amongst kindergarten children.