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Investigation of Guided School Visits:
Focus on Professional Museum Educators'
Perspectives, Practices and Roles

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ABSTRACT

This case study examines six professional educators' perspectives towards learning in museums during a school visit. Museum educators are understood as the mediators of both individual and institutional knowledge. Therefore, further implications of their approaches used are investigated. This study focuses on researching educators' pedagogical practices as well as how they perceive learning and how they structure their visits. In addition, it explores educators' perspectives towards their role and functions. Finally, the profession of museum educators is discussed. Semi-structured interviews were held with six museum educators from different museum settings. Findings in this study suggest that museum educators employed conversation and questions to identified prior knowledge and interest. However, even though prior knowledge and interest consider to be important factors for learning they do not lead always the visit but educators focus on content based knowledge. Furthermore, data demonstrated that there is no professional training for museum educators.

Keywords: school visit; museum educators; object-based learning; museum learning, museum educators' profession

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CHAPTER ONE: INTRODUCTION

Museums were created to collect items that consider to be valuable (Hooper-Greenhill, 2007). In the nineteenth century, museums became public to provide education. Today, museums are popular educational environments for families and school groups and provide learning opportunities (Falk and Dierking, 2000). Museum educators develop and support learning in museum settings. In this study, museums represent non-formal learning environments for students during guided tours.

Teaching and learning in places outside school environments, such arts museums, science centres and botanical gardens is often a challenging experience.

Recent research indicates that museums as highly social settings are ideal environments for enhancing learning (Cox-Petersen et al., 2003; Zhai and Dillon, 2014). Learning in museums is supported and developed by museum educators. Educators in museum settings are the facilitators that engage students directly with the objects in a learning experience (Hooper-Greenhill-Mousouri, 1991; Pringle, 2009). However, although museum educators support learning opportunities for students “there is a limited body of literature [...] which details how museum educators do their work, and what body of knowledge they apply” (Tran and King, 2007, p.133). It is therefore important to investigate how educators' support learning in museums.

Furthermore, although the role of museum educator has a long existence and importance in museums (Hein, 1998; Hooper-Greenhill, 2007), there is a limited research on how educators support their work, both in practice and theory. Davidsson (2012) found that there is little research examining staff members' approaches and beliefs about learning in museums. For example, how they structure a school visit and what approaches or strategies are used when planning a lesson. Furthermore, DeWitt and Hohenstein (2010) argue that research on learning in non-formal settings focuses on the factors that influence learning during a visit, whereas research about the mechanisms used by museum educators to support and enact learning is limited. Overall, studies suggest that

there is a limited degree of research that explores the role of the museum educators in facilitating learning from museums (Falk and Dierking, 2000; DeWitt and Hohenstein, 2010; Davidsson, 2012). Therefore, there is a need to explore the museum educator beliefs, ideas and knowledge related to museum learning.

The aim of the study is to explore the perspectives of six professional museum educators towards learning in museum settings. Thus, this study examines the structure and pedagogical practices of educators during a guided visit to a museum. Furthermore, the study seeks to gain a better understanding of the role, the functions and the profession of educators within the museum field. Therefore, research questions investigate and explore the following four items:

- a) How do museum educators structure their visits?
- b) Which are the pedagogical approaches used by museum educators to support learning during a school visit? Sub-question How do museum educators use activities and interactions during the visit?
- c) What is the role and which are the functions of museum educators?
- d) How do educators perceive their profession within the museum field?

The purpose of this case study is to explore the perspectives of six professionals towards learning in museums during school visits. The focus is on the ways educators facilitate and enhance learning in museum settings. This study examines six museum educators from different institutions with varied exhibits and disciplines, such as science museum, botanical garden and art museums were interviewed to contribute to a common understanding within the museum field. A qualitative method was used with the tool of interviews. The educational constructivist views and sociocultural theories framed this study emphasises the active participation and the language in the construction of knowledge. This study seeks to understand how museum educators support learning, in this case

through interactions between children, educators and objects and the use of conversation and questions.

Chapter One introduces some background information about the topic. Chapter Two discusses theories related to learning in museums. Chapter three reviews previous studies in the field and gives form to the research questions to be examined. Chapter Four presents the data collected during the interviews and refers to possible limitations of the study. Chapter five presents the implications of the results and Chapter six further discusses the discussion and includes suggestions for future studies.

1.1 Definition of terms

Museums: The term museum refers to a wide range of free-choice/informal educational institutions, including botanical gardens, science centres and a variety of other exhibitions and collections (Falk & Dierking, 2013, p.25).

Museum educator (Pedagogue): The term museum educator is used to refer to a paid member of museum staff employed to engage in face-to-face interaction with visitors (Tran & King, 2007, p.133).

Lessons: The term lessons refer to the practice of museum educators during organized school visits (Tran & King, 2007).

Pedagogic practices: The practices of teaching and learning pedagogy: How we should teach (Hein, 1998, p.16) and the principles, practice, or profession of teaching (Dewey, 1938, p.19).

Lessons: The practice of museum educators in organised programs such as [...] class lessons (Tran and King, 2007, p.133).

1.2 Significance

This study intends to contribute to a wider understanding of the museum educator-led pedagogical practice by examining specific professional perspectives of their practices across non-formal contexts. I would like to note, from recent literature, that there is no apparent dichotomy between learning in school and learning outside school, as Hohenstein and King (2011) suggest; “learning is learning is learning” (p. 175). Nevertheless, this study investigates the process of learning and teaching in settings outside the school. The settings I have chosen are: a botanical garden, a science centre, an aquarium, a museum of art, crafts, design and fashion, a natural history museum and an art museum in Sweden in relation to a wider context of non-formal environments. This variation is intentional, with the objective to identify common patterns. According to Tran and King (2007), building a mutual ground of issues relevant to educators in other disciplines can encourage discussion of how these ideas could be applied more broadly. Hence, the ideas presented in this study could be invitation for further discussion among the museum educators that are participating in the case-study.

Research on teaching and learning in non-formal settings focuses on museums educators. This will benefit a connection between experiences in, and beyond, school while attempting to highlight approaches used in museum settings that can lead to advanced research on museum education and will in turn try to fill the gap in knowledge and studies of learning out-of-school settings. Moreover, this study intends to raise issues that are relevant to educators in other museum disciplines and thus provide a common framework for a wider application of pedagogies which can contribute to the professional community of museum educators.

In the next section, the theory used is presented to provide “a broad explanation for behaviour and attitudes” (Creswell, 2013, p.64) and to answer the research questions. Educational constructivist views and sociocultural theories were used as the theoretical framework to make sense of the dy-

dynamic interactions between museum educators, students and artefacts displayed in museum settings in the form of active participation, conversation and questions during a school visit.

CHAPTER TWO: THEORETICAL FRAMEWORK

This study is related to learning in museums. It is framed by an educational constructivist lens, which views learning as an active process with experience and motivation as important aspects (Dewey, 1938; Hein 1998) and builds on socio-cultural theories which consider learning a social process, with language as an important factor that impacts learning during a museum visit (Vygotsky, 1978).

In order to understand Dewey's concern with learning the notion of experience should be considered. Dewey's (1938) experience is defined by the idea that, "there is an intimate and necessary relation between the process of actual experience and education" (p.20). For Dewey, education must allow children to learn from doing and involve experiences and interactions with other people. Per Dewey's notion of experience not all experiences lead to learning. That is why Dewey referred to an experience as 'educational' if it meets these criteria:

- It is based on the children's interests and grows out of their existing knowledge and experience
- It supports the children's development
- It helps the children develop new skills
- It adds the children's understanding of their world
- It prepares the children to live more fully

(Mooney, 2000, p.14)

Dewey (1938) suggests a child-centred education, with active participation that involves social interaction. This means that learning is an active process that involves 'real-life' experiences (p.4).

To make the application to museums, Dewey's notion of experience should follow the visitors' experiences through the interaction with the exhibits and then visitors' assimilation of the experience

in order to affect later experiences. This supports Dewey's (1998) definition of an educational experience which includes "continuity and interaction between the learner and what is learned" (p.x).

Educational constructivism is an approach to the theory of education in which construction of new information is linked to prior knowledge and to motivation. Educational constructivism supports that, "a new construct or approach [...] would prompt the reorganisation, or accommodation, of the new concepts into a mental framework leading to a new stage of conceptualisation" (Hohenstein and King, 2011, p.177). This approach is more related to individually driven experiences of the child who engages in facilitating new knowledge. This idea considers that, "providing people with opportunities for direct interaction with their environment and for constructing their own world" (Hooper-Greenhill and Mousouri, 1991, p. 5).

A constructivist approach to learning is utilised by Hein (1998) to understand learning in museums. Hein (1998) emphasis on the active participation of the learner and the child's learning within its own reality of the world. Hein (1998) also supports the idea "that learners construct knowledge for themselves - each learner individually (and socially) constructs meaning - as he or she learns" (p.89). This means that the teacher can provide guidance to the child, but the child individually needs to actively engage in building its own knowledge based on experience. In that sense, the museum educator's role is to communicate the museum content by supporting the visitor's knowledge. But this creates a challenge for the educator who is not always aware of the visitor's previous experiences (Tran and King, 2007).

Constructivist learning activities require active participation of the learner. Learners use both their hands and minds to interact with new experiences that increase their understanding (Hein, 1998). In school visits, constructivist view takes the perspective that students can connect with objects and exhibits through activities based on previous experiences. A constructivist exhibition according to Hein (1998) should provide learning opportunities for the child and would be likely "to present various perspectives, validate ways of interpreting objects and refer to different points of view and

different 'truths' about the material presented" (p.35). Hein (1998) support that a constructivist exhibition should encourage children to interact with the world, enhance understanding and make generalisations about the concepts they engage with.

Social-cultural theories emphasise the role of the other people in constructing knowledge. Vygotsky (1978), whose work is linked historically to sociocultural theory, views learning as a social process that occurs through discourse with others. Vygotsky (1978) considers that, "social and cognitive development work together" (Mooney, 2000, p.82). He believes that interactions with teachers and peers and the knowledge shaped by the environment (family, society, education and culture) construct knowledge together. This approach is related more to the importance of children's interaction with others in advancing children's knowledge. According to social-cultural theories, children can learn through shared experiences with their environment, often guided by more knowledgeable people. This view emphasises the role of talk to support visitor's learning.

In addition, according to Vygotsky (1978) language supports children's learning. From this view, the role of language (questioning, talking) is important in extending child's learning (Mooney, 2000). Vygotsky (1978) believed in the social interaction for individual development, in the form of language. He suggested that teachers can support students to reach higher levels of comprehension or skills through dialogue and structured questioning. This support is called 'scaffolding'. A term introduced by Wood et al. (1976), scaffolding can help children to understand new concepts and ideas with assistance, usually in the form of language. Vygotsky (1978) also focused on the concept of the zone of proximal development (ZPD). ZPD refers to the child's actual development; what the child can do on his/her own and to the level of potential development; what the child can do with assistance. The use of ZPD for teaching implies that the teacher should challenge the children to reach higher level of skills and knowledge within the zone. Falk and Dierking (2012) also support the idea that the educational practice of museums that promotes the understanding of a concept through scaffolding.

Vygotsky's (1978) work emphasises the role of language and of social interactions in advancing knowledge. More specifically, talk is an important component for learning. Through social interactions, conversation with teachers and peers are encouraged which can lead to learning. Sociocultural perspectives emphasise the context (physical setting) and the role of talk in supporting learning. This study is looking at educators' discourse in museum settings. Museums are highly social environments where people are engaged in shared experiences. Educators support the children's interaction with the objects on display during social activities mostly in the form of talk, such as conversations and questions (Tran and King, 2007). Children also interact with objects by making their own personal and social meaning. Hence, Hein (1998) argues that it is easier for children to recall a practical activity rather than reach the goals and intentions of a guided activity, in museum settings this means that the exhibitions should be designed to interact with the learner.

Both Dewey and Vygotsky emphasise the active participation in the process of learning which includes the interpretation of various exhibits and collections (Hein, 1998). This view of learning highlights the shift from traditional teaching approaches to a more learner-centred approach. The meaning that each individual makes of what she or he sees is based on the personal context of prior experiences, knowledge and interest (Falk and Dierking, 2013).

Learning can also be examined with respect to the child's motivation and background, which are considered significant factors in an educational experience. A child's interest is a dynamic vehicle for advancing the quality of what is learned. DeWitt and Hohenstein (2010), also value the significance of one's interest in the learning process and state that, "engagement with a topic or subject is a critical aspect of supporting learning in any setting" (p.44). In addition, Hohenstein and King (2011) suggest that when children engage in an activity that they find interesting, their motivation towards a topic or an issue advances the quality of the learning experience. This in turn leads to the intrinsic motivation which "may lead to a deeper understanding" (p.179).

As far as museum learning is concerned, Hooper-Greenhill and Mousouri (1991) agree that the physical and the social environment plays an important role (Hooper-Greenhil and Mousouri, 2001). For instance, an activity can involve exhibitions which allow exploration, or workshops which offer practical experiences. Yet, the educator's support as a mediator of the visitors understanding should be taken into consideration. In addition, DeWitt and Hohenstein (2010) indicate the social value of museum visits and argue that a visit supports opportunities for interactions. Therefore, for students a museum visit can provide a complex set of activities that engage them with exhibitions and focus on interactions between them, among the students, the educators and the teachers.

It should be noted that the transmission of the museum content cannot be separated from the objects and the exhibits featured in these setting (Tran and King, 2007). For example, Zhai and Dillon (2013) have found that social interactions support knowledge through objects and conversation. Learning in museums should allow for an active dialogue between the learner and the museum (Hein, 1998), this dialogue is supported by the objects displayed in museum settings. Hence, museums are places where cultural and natural objects are represented, the use of these objects supports interactions that are allowed by the active engagement of the learner (Leinhardt and Crowley, 2002). These approaches have informed and have been widely used by staff in different museums for exhibitions, learning, teaching and teacher training programs (Hooper-Greenhill and Mousouri, 1991). Hein (1998) also used the constructivist approach to understand and interpret learning in museum environments.

In the next section, the literature review connects reviewed studies to learning in museums, relates the study into an ongoing dialogue about museum learning, provides the background and the context of this study and highlights gaps that need to be further discussed and studied. Therefore, the literature review provides information about the value of object-based learning in museum settings and learning within non-formal contexts. In addition, it presents the ways learning is supported and

communicated by museum educators during a school visit. In addition, discusses the role and the profession of museum educators within the museum field.

CHAPTER THREE: LITERATURE REVIEW

Learning in museums is perceived as more open-ended than in formal education, in this study the nature of learning is the same regardless of the settings in which it appears. This is because in most of the discussions about this dichotomy between formal and non-formal contexts, common practices and attitudes have been observed in both environments. For instance, King and Glackin (2014) support that:

Whilst classroom based activities are undoubtedly constrained by timetables, space, and resources available, the learning may indeed be open-ended and learner-centred. In contrast, we have observed many school visits to museums and nature reserves that are highly structured and offer little opportunity for students to follow their own interests. (p.3)

Moreover, as Hein (1998) argues the terms 'formal' and 'non-formal' education are descriptions of the settings and should not depict the process of learning. Hence, the concept of non-formal learning refers to the settings outside the classroom and the range of different educational activities (Hohenstein and King, 2011; Falk and Dierking, 2000). However, learning is the same wherever it occurs, the difference can be identified mainly to the environments in which it takes place.

3.1 Object-based learning

Museums focus on the "stuff" of the world. They specialise in the objects representing both culture and nature and, therefore become central to any educational effort when the focus shifts [...] to learners' active participation through interaction with objects. (Hein, 1998, p.6)

The objects surrounding the museum provide a unique experience for visitors. Historically, museums used the objects to communicate with the visitor (Falk and Dierking, 2012). Today, objects displayed in the museum invite for an open discussion between the educator and the student (Schu-

bert, 2009). Communication between the museum objects and the visitor have been increasingly embraced by the educator who uses the objects as his or her key focus. The objects, such as paintings, living animals or plants, are specimens used by museum educators for creating interactive exhibitions. These exhibitions support the direct engagement with the object and create an experience. In other words, these exhibitions allow the visitor to use his or her senses towards real things from a real world in museum settings. In summary, museums are collections of things that are “the essence of a museum” (Falk and Dierking, 2013, p.111).

What distinguishes museums the most from other environments is their ability to display three-dimensional objects while school use words and images. Real objects, in their actual scale are represented, this features an impressive characteristic of a museum experience. Falk and Dierking (2010) indicate that one of the strengths of the museum is that provides authentic experiences, which give the opportunity for the learner to visualise his learning, and further to use her or his senses by touching, hearing, seeing in three dimensions (Falk and Dierking, 2013).

Museum collections and objects offer opportunities to discuss and reflect. More specifically, “objects are employed in a variety of ways to enhance and disseminate subject specific knowledge, to facilitate the acquisition of practical, observational and drawing skills for inspiration” (Chatterjee, 2011, p.38). Museums are places where objects have been selected as ones of high cultural value or because they represent a unique example. Moreover, studies state that the objects displayed in a museum and the phenomena they provide offer a significant experiential role (Falk and Dierking, 2010; Hein, 1998). Hooper-Greenhill (2007) in her book “Museums and Education: purpose, pedagogy, performance” supports that activities in museum settings that combine objects of the collection engage students in exciting experiences that lead to learning. Experience-based learning highlights the richness of the museum object, which can support learning activities through workshops. In that case settings enable active engagement, where the activities have been designed and selected to advance and inspire learning conditions.

Museum experiences provide a better understanding of the meaning that children make of objects and the role of objects in supporting learning. Also, children have the opportunity to get familiar with a concept in a real context (Savo and Arndt, 2014). For instance, the use of the exhibits and the objects in the museum can provide the student with skills of observation and categorisation (Leinhardt and Crowley, 2002). Indeed, DeWitt and Hohenstein (2010) argue that museum environments support the comparison of different objects and can advance the scientific knowledge. Furthermore, objects encourage conversations which can advance learning (Dierking, 2002). In addition, objects can support the acquisition of specific content knowledge (Chatterjee, 2010).

The use of objects in supporting learning can play an essential role during guided visits in museum environments. Duhs (2010) also argues that research suggests that the active engagement of students with the object can promote positive learning environments. Moreover, working with objects can provide a multiple sensory environment for learning as the sense of touch can lead to a more memorable learning experience. Tran and King (2007) who investigated the pedagogical actions of museum educators in science museums suggest that the objects displayed in museum settings support a memorable experience, distinguish museums from other institutions and feature authentic objects that make museums unique environments.

Despite this increasing interest on the role of object in learning (Ash, 2004), the application of objects and exhibits during a museum visit is limited (Tal and Morag, 2007). Leinhardt and Crowley (2002) in their study about children's' object-centred learning suggested that the use of objects and the interactions with the exhibits is a more common feature of science centre's whereas art museums and natural history museums focus on collecting artefacts and displaying their objects. In art museums teaching from art objects bring a variety of viewers' perspectives. These perspectives are filtered and directed in some point from educators which share their experience and knowledge while encouraging visitors to think for themselves (Rice and Yenawine, 2002).

3.2 Learning in Botanical Gardens, Natural History Museums and Science Centres

Experiences outside the classroom provide a wider range of opportunities for students to understand different structures and different sorts of social interactions than those that they are used to in school, however, teaching and learning in places outside school environments such as museums, science centres and botanical gardens, is often a challenging experience (Braund and Reiss, 2006). Yet, learning experiences “outside the classroom offer students the opportunity to develop across the cognitive, affective, and physical and behavioural domains of learning” (King and Glackin, 2014, p.11).

Learning outside the school environment gives students the possibility to observe phenomena in their natural contexts (Savo and Arndt, 2004). According to Zhai and Dillon (2014) recent research on botanical garden educators' pedagogical moves during a school visit has indicated that school visits to non-formal settings can reinforce students' cognitive learning and have a positive effect in their social abilities. They also found that teachers believe that school visits to non-formal settings work as a complementary tool that enhance ideas within and beyond the curriculum and raise the interest in science of students. Tal and Steiner's (2006) study on teachers' and museum staff relationships before, during and at the end of a school visit at a science museum in Israel described that, “teachers perceived the museum visit mainly as an opportunity for personal and scientific experiences [...] and completing the curriculum and enrichment” (Tal and Steiner, 2006, p.35). Thus, a museum visit can be seen as a learning experience that advance the existing knowledge, motivate students to learn science, support school curriculum goals and can advance the possibilities for learning beyond classrooms (Tal and Morag, 2007; Allen and Crowley, 2015). Allen and Crowley (2013) which explored professional museum educators' development in a natural history museum,

also supported that learning in non-formal settings increase the possibilities for scientific knowledge.

Botanical gardens are authentic environments in which students can advance their biological knowledge while they can appreciate the natural environment (Zhai and Dillon, 2014). In addition, “research indicates that school trips to museums and science centres can result in cognitive and affective gains for students” (Anderson & Lucas, 1997; Bell, Lewenstein, Shouse, & Feder, 2009; Flexer & Borum, 1984; Orion & Holstein, 1994, as cited in DeWitt & Hohenstein, 2010, p.41).

Natural history museums enhance students' opportunities to engage with real science and create experiences that integrate authentic objects from collections. For many years, the museums' educational activities followed a 'look and learn' model with the use of objects as the main tool for communicating knowledge and new concepts. One of the first interactive exhibitions in natural history museum settings was the Human Biology at the natural history museum in London. Human biology was supporting visitors to explore the human development from conception to old ages. Muscle actions were displayed by visitors using their own arms to perform a model of the visual recognition of human limbs movement. This process engaged senses and abstract thought for understanding the process of human development. The idea of engaging the visitor into the exhibition became popular after the reputation of this exhibition (Thackray and Press, 2013).

Science and natural history museums have been popular destinations for children and family. Tal and Morag (2007), who explored learning in museums during school visits to four natural history museums, argue that throughout the years, museums educational goals have been emphasised and they have become places that provide educational activities and interactions for children and youth. They also emphasise the role of objects and exhibits for the knowledge construction. Thus, natural history museums feature exhibits in the form of “science specimens, cultural and historical artefacts” (Cox-Peterson et al.2003, p.202). Leinhardt and Crowley, (2002) also state that the focus on hands-on experiences and exhibitions that promote conversations and questions about an object

(dead or alive) in the learning process have increased, especially in the science centres. As such learning science and technology in out of schools' settings using interactions with others has increased, as they are encouraged by the museum settings (Tal and Morag, 2007).

Natural history museums have long been a favourite destination for millions every year. The idea of the natural history museum collections is to reflect the natural world itself (Thackray and Press, 2013).

3.3 Learning in Art museums and Galleries

Museums of art are flexible environments where interpretations of the objects displayed are allowed. This promotes a dynamic relationship between museum environments and audiences.

Schubert (2009) argues that art museums and galleries are no longer environments that display only works of art, but have shifted art into a visual spectacle. More recently, art museums have started to have interactive parts in their collections (Falk and Dierking, 2012). The previous use of a narrative approach of exhibitions in art museums has shifted to a more dynamic presentation of objects and exhibitions. Consequently, instead of only presenting objects, the museum focuses on the interpretation of objects which invites various meanings and positions art through collections and exhibitions available for the audience. Schubert (2009) supports that the visitor's approach has progressed to an active involvement with the museum.

In recent years, visitors' experiences have shifted the focus from the individual art object to various meanings that can be drawn from it. This shift highlights the introduction of critical thinking into the museum context. In the beginning the role of educators in art museums was more informative (Hooper-Greenhill, 2007). For instance, educators presented the object's content by putting up labels without being concerned with the interpretations or thematic displays of the collections (Rice and Yenawine, 2002).

Hooper-Greenhill (2007) emphasises that the interpretation of the objects has been a priority of museums. In general, the significance of the interpretation has begun to play a more central role in the museum environment. Thus, museums have become “active in shaping knowledge” (Hooper-Greenhill, 2007, p.2), this is achieved by combining objects in displays and exhibitions to produce a dynamic view of the past and the present in order to explore the various meanings. Also, the presentation dominates the displays through the use of objects, paintings, texts and models and, as such, produces possibilities for learning.

Rice and Yenawine (2002) in their article “A conversation on object-based learning in art museums” state that educators’ teaching methods should support the learner’s own meaning. One of the main differences between art museums and science centres, natural history museums and botanical gardens is the interpretation of the objects displayed. Accordingly, the focus of art museums is trying to understand what is presented to the observer by artists, while the scientific museum settings use objects, living animals or plants as the evidence of various theories. The strategies that are used by educators to support the understanding of the art are probes and ‘visual thinking strategies’ such as “ask people to look and look again” (Rice and Yenawine, 2002, p.5). Their role is to help visitors interact with the object in a way that inspires them to think in a different way and stimulate deeper thinking. Educators, since they have limited time with the students need to design and plan activities that lead to further understanding, that link selective information to art and that inspire students to get more interested in a specific topic.

3.4 Educators’ pedagogies during a museum visit

The recent attention to the educational potential of museums has prioritised the role of museum educators in supporting learning during school visits. Moreover, teachers claim to prefer a lesson by museum educators during their school visit because they believe that they have mastery of the spe-

cific knowledge (Zhai and Dillon, 2014). For instance, an educator can offer a detailed insight into the exhibits and the artefacts presented in a museum.

The complex nature of the role and functions of educators is depicted in the varied responsibilities which are involved in the planning and the development of educational programs for school groups and public of different ages and expertise (Tran and King, 2007). The planning process of a lesson could take into consideration the objectives of the curriculum and thus can advance the student's learning (Allen and Crowley, 2015). However, a communication between educational staff and teachers provides a better quality of learning in non-formal settings. Glackin and King (2014) suggest that findings from prior studies consider this collaboration between teachers and museum educators crucial for an effective visit.

Despite recent attention to the educational role of museums, the pedagogical practices used during a visit have been neglected (Tran and King, 2007). Tal and Morag (2007) found that museum educators follow a traditional model of teaching, lecture-oriented with limited interactions. They also report that the educators use questions as their main means for communicating with students, but most of the time the questions are simple and involve a lower cognitive level of answers, such as yes or no (Tal and Morag, 2007). In addition, the teacher-led way of educators' teaching during the visits have led to missed learning opportunities (Zhai and Dillon, 2014).

3.4.1 Interest and prior knowledge

Prior knowledge shapes the behaviour of an individual during a museum visit and personal interest reflects the learning outcome of an experience (Falk and Dierking, 2010). In that sense, Dewey (1938) suggests that when planning an activity, the interest and the background of the children should be considered the starting point for the educators, while the settings goals should promote advance in knowledge.

Interest leads to further motivation about learning a topic, specifically when children engage in an experience which they found interesting then they value it more and enjoy it more (Falk and Dierking, 2012). Hence, beliefs and attitudes influence the meaning of an experience. Tal and Morag (2007) have noticed that educators use background questions as a tool to communicate with the children and provide explanations. Moreover, Rochelle (1995) argues that prior knowledge is a significant tool for advancing learning (as cited in Falk and Dierking, 2012). Further, taking into consideration the child's prior knowledge has a great impact on the way he or she engages with objects.

In addition, Schiefele (1991) found that interest can contribute to learning by leading students to invest greater time and effort in comprehension of material. However, in their study Tali and Morag (2007) found that museum educators rarely asked about the prior knowledge of the students.

3.4.2 Discussion and conversation

Conversation has been established as a significant element for learning (Ash, 2004, Allen and Crowley, 2015). Vygotsky (1978) believed that interactive situations, such as conversations support a child's development. Also, sociocultural theory supports that language, in the form of conversation, is the medium of interactions (Ash 2003).

Several studies have indeed focused more precisely on discourse that occurs in non-formal settings, such as museums (Allen, 2002; Ash, 2002, 2003; Crowley and Jacobs, 2002; DeWitt and Hohenstein, 2010). For example, Allen (2002) who examined learning in visitor talks in museum settings found that most of the visitors' talk was about the exhibits and the conversations were mainly focused on what was currently in front of them. Similarly, Crowley and Jacobs (2002) highlight the opportunities that parents exploit during a visit to a museum to contribute to a child's interpretation through prior knowledge, including instant 'explanatoids'. The shared prior knowledge of both the parents and children allows these family conversations to provide a deeper level of explanatory talk that appears to be richer and more focused. In addition, Ash (2002) examined family conversation

effects on children's understanding of science content in museums. She found that parents use guided, or directed questions, as a mediation tool to get the children engaged in the scientific content. Thus, these questions are being used as a scaffolding aid supported by the exhibits.

Hohenstein and King (2011) have indicated that a previous study of Alison King (1994) showed that the use of guiding questions and explanations supports higher understanding and application of new information. Thus, discussion, conversation and questions are verbal tools that support learning opportunities. Ash (2003) in another study examined families' conversation in museum settings where she found that families used biologically based thematic content in order to provide science learning. She also found that parents used questions in various ways; for instance, to connect with prior knowledge, to invite further explanations as well as to invite further thinking using open ended questions. These strategies invited an ongoing dialogue on biological categories. King (2006) investigated the role of museum educators in facilitating learning in art museums. She found that museum educators support learning by scaffolding conversation mainly in the form of language.

In addition to reflecting on questions as a tool for teaching and learning, studies indicate that asking questions is the most common form of communication between students and museum educators (Tal and Morag, 2007; Cox-Petersen et al., 2003). Ash (2004) in her examination of the use of questions at the natural history museum of Los Angeles County emphasises the use of questions as a mediation method to support a deeper scientific understanding. She also claims that questions are usually used by family members during conversations, while they are interacting with objects among the family. Additionally, Sanders and Hohenstein (2015) in their study draw attention to the ways children learn through family conversation suggesting that family conversations in museums support scientific explanations and learning in relation to notions of life and death.

Research on museum learning indicates the importance of conversation with reflection as a guiding principle that encourages students to embrace a deeper engagement to learning (Allen and Crowley, 2016). Thus, conversation, as a complementary learning tool, helps educators and children through

questioning and talking to understand concepts and topics in a deeper way (Allen and Crowley, 2014).

Conversation and reflection have both been established as important aspects of museum learning (Allen and Crowley, 2015) but conversation does not always lead to learning, this depends on the subject matter under consideration (Sanders and Hohenstein, 2015). For instance, conversation with reflection is a way for engaging the children in the topic while integrating it in the learning process (Allen and Crowley, 2015). However, Tali and Morag (2007) found that during the visits, museums educators rarely start a conversation with the students.

3.5 The Profession of museum educators

3.5.1 Education within the museum profession

“In addition to its emphasis on learning as an important role of museum, educators in museums consider learning in these environments equally significant”

(Hein, 1998, p.14)

The shift in importance of the educational role of museums has changed the importance of the profession within museums. The modern museum educator plays a central role as a facilitator of the visitor's experience in museums. Museum staff have worked to adjust exhibitions and programs to the educational goals of the school curriculum (Hein, 1998). However, it should be noted that there is variation in the educational context of schools and museums (Tran and King, 2007).

Today, the museum education profession has moved forward in many positive directions due to the increased attention to the educational role of museums. But still, there is a need for further progress in the profession, which is recognised by both teachers and educators (Griffin, 2011). Even though, educators in non-formal settings have been valued as significant participants in advancing knowledge during school visits, yet their profession development is not supported enough. Allen

and Crowley, (2015) suggest that there is no training program for museum educators who usually lead a visit based on individual prior learning experiences. Hence, one of the most important aspects of professional development is a common base knowledge for professional preparation and practice and a shared theoretical framework (Tran and King, 2007). However, the various backgrounds of museum educators create implications for professional development. This diversity of identities makes the establishment of a common theoretical base even more challenging.

3.5.2 The practice of museum educators

The role of museum educators includes multiple tasks and various responsibilities. They design and plan school and public visits, they work with a diverse range of ages and they engage with different educational parts (Tran and King, 2007). Thus, the functions of museum educators emphasise the complex role of museum educators and the challenges for teaching in museums settings, which involve specific content knowledge and various skills.

Cox-Peterson et al. (2003) investigated guided tours at a natural history museum of school groups. They found that the practices of museum educators were more authoritative. Still, the findings depicted a positive attitude towards the visit expressed both by students and teachers. Zhai and Dillon (2014), also conducted a study on the pedagogical actions of museum educators during school visits with focus on the discourse as a strategy that supports learning. Their reports on this approach point out that educators' communicative attitude supported limited interactions. Moreover, Tali and Morag (2007) investigated the pedagogical activities of a guided tour in a science museum. They also addressed the guided - centred approach of the visit. However, students were engaged and expressed a positive attitude through activities that supported by active participation, such as games and teamwork. These studies reflect on research on the impact of museum educators' practices and on the nature of learning, however research on the perspectives of educators about learning in museums is limited.

Tran and King (2007) indicate that research on the practices of museum educators during a visit and the theoretical framework that they apply is still limited. For instance, Allen and Crowley (2013) suggested that previous research on the practices of educators during visits in museums have shown that educators support experiences in a more didactic way, giving few chances for discussion between them and the children. Also, in the same study they found that they apply limited strategies for educational engagement with the children, which appears like that of classroom teachers (2015). These findings reflect on the challenging nature of teaching and learning science in museum settings.

Previous studies on the practices of museum educators in science centres (Tran, 2002; King, 2006) report on the complexities of museum education within the profession, which implies that educators are aware of the strategies that they need to apply for supporting learning in museums. Yet, these practices are not specific and varied from one institution to the other. The professional development of museum educators should focus on the establishment of a common professional language and a museum pedagogy with a student-centred approach. Also, a clear set of objectives should be designed in order to support an understanding of the learning expected during the visits (Allen and Crowley, 2015). When designing the objectives of the visit the educators should consider possible connections with the curriculum which can help teachers understand the visit's goal and connect them with the school material could be more beneficial to student learning. In addition, Allen and Crowley (2015) suggest that educators reflecting on their own experiences and discussing the challenges and the successes they face during a school visit with their colleagues, is one of the most valuable approaches for generating new ideas and strategies for their professional development. These conversations give the opportunity to educators to express their individual feedback and to communicate new ideas for future applications.

3.5.3 The profession of museum educators

The professional preparation and practice of museum educators should include a distinct knowledge base and skills related to learning in museums. Tran and King (2007) have stated that the professional preparation of museum educators needs to be established and a framework of pedagogy (distinct knowledge and skills) should be applied, in this way their profession would have an accepted theory base that could be applied more widely. They highlighted that the professionalization of museum educators would lead to a “professional respect and recognition” (p.132). Teaching in science museums, and in museum settings in general, is a complex process. Thus, a common set of skills and a shared knowledge among colleagues supports the identity of the profession, define the learning objectives and value the significance of the role of educators (Tran and King, 2007; Allen and Crowley, 2013).

Training is a way to provide support to non-formal educators in terms of professional development. Thus, reflection on the pedagogical activities during a visit, where new ideas and pedagogies are under discussion and consideration is an approach that can lead to a common base practice for educators. More specifically, Tran and King (2007) argue that, “investigations into the pedagogical actions of educators in science museums suggest that educators do not share a common understanding of best practice, which may be due to the absence of professional preparation grounded in a recognised knowledge base” (p.131). But for these implementations to be improved, there is a need for reflection and conversation among educators, an action which is of a great importance. In addition, Grenier (2005) had stated that “without training reflective of engaging programs that encourage questioning, interaction and experimentation, docents will likely continue to lead tours in a manner that mirrors their prior learning experiences in schools and in docent training” (as cited on Allen and Crowley, 2013 p.85). Therefore, educators should have the chance to share previous experiences or challenges, for further evaluation and discussion. Tran (2002) likewise indicates the need for support on the reflection of their practices. He also points out the emerging issue of an estab-

lishment of professional practice and pedagogy for the community of the museum educators within the museum field. As a result, this community can build a common practice of teaching and learning together with “differentiate practices and strategies for engaging different kinds of audiences, and support ongoing professional development through conversation and reflective practice” (Allen and Crowley, 2015, p.101).

3.5.4 Professionalism

The concept of professionalism can establish particular knowledge and skills that can distinguish a profession from an occupation. Professionalism describes the qualities, skills and the behaviour that practitioners expect to be passed on the next generation of practitioners. Research on professions focuses on the identification of specific aspirations between groups. Larson (1977) identified the professions as occupations with specific bodies of knowledge that encompass the central needs and values of the social system. In addition, Friedson (1994) notes that, “the concept of a profession has specific institutional and ideological characteristic more or less in common, producing distinctive occupational identities [...] which set each occupation apart from the others” (p.16). In this study, professionalism is “the process whereby an occupation works toward becoming a profession” (Tran and King, 2007, p.135). In order for an occupation to be perceived as a profession, the identification of knowledge and skills in an organised way is required. Therefore, a description of the professional activity and an adaptation towards the needs of the society is allowed. Tran and King (2007) also suggest that discussion and reflection among the practitioners about their experiences and practices can improve their understanding on the specific topics. Hence, they emphasise that by making identities distinctive, members can define their knowledge and their objectives.

3.5.5 Professionalism in museum education

Museum educators are the only human point available to mediate the knowledge between the public and the objects on display. Museum education needs to be established and developed as a profession through a specific theory and an even further research on the field, in this way educators can

acquire their professional value. Another process to the professionalization of the museums education is the open dialogue among members within the profession (Allen and Crowley;2013, 2015; Tran and King, 2007). Moreover, educational programs for educators in the form of training programs and courses related to museum education can contribute to the professionalization of the museum field.

The museum education profession has been an issue under consideration over decades, but “if museums wish to offer a meaningful contribution to education in society [...] they need to ensure the quality of their education provision [...] the professional preparations and qualification of their staff” (Tran and King, 2007, p.145). To advance the learning experiences in non-formal setting, it is significant to support the structure of the learning before (planning), during and post the experience. In this way, the learning outside the classroom is complementary to the learning that occurs inside the classroom (Hohenstein and King, 2011). DeWitt and Hohenstein (2010) argue that the structure of the trip is a factor that can influence the learning attitudes.

The next section focuses on the structure of a visit, the pedagogical approaches of the educators and the profession of the museum educator is discussed using interviews with the museum educators in the sample museums.

CHAPTER FOUR: METHODOLOGY

This study adopted a case study approach, (Gillham, 2000b) as the main method engaging semi-structured interview tools to explore current museum educators' pedagogies during several visits to museum environments. The philosophical approach of this study was a qualitative research study, which took place in museum settings with the researcher as the key instrument (Creswell, 2009). The data were collected through reviewing relevant literature and by engaging the participants in semi-structured interviews. This study used interviews and the literature review as the two main sources of data. All the data are reviewed and organised into categories. The focus was to present the meanings that the participants held about the topic including all the key information (similar or opposite to the literature or to the other participants 'perspectives) provided by the research participants.

Case studies can be defined as detailed analysis of a case bounded by time and activity (Creswell, 2009; Cohen, Manion and Morisson,.2011). Stake (1995) stated that, "case study is defined by interest in individual cases, not by the methods of inquiry" (p.236). Also, a case study can be understood within its context (Gillham, 2000a). In addition, case studies explore "lived experiences of, thoughts and feelings for, a situation" (Cohen et al. 2011, p.290). This study adopted an instrumental (Stake, 1994 as cited on Cohen et al., 2011, p.291) case study approach which seeks to explore specific attitudes and practices to answer the research questions. Case studies have various applications to social science and educational research (Cohen et al., 2011).

A case study is a suitable approach for this study as it brings 'real people in real situations', which can establish an understanding of ideas and abstract principles together (Cohen et al., 2011, p.181). The relationship between case study and interviews is that a case study allows for interviews with participants to become a flexible and productive research tool (Gillhamb, 2000). This is especially significant as a case study also allows participants to apply their own meaning to the topics and delimit their beliefs, ideas and experiences.

The role of the researcher highlights the interpretative side of the qualitative research. The researcher is involved in experiences with the participants from which can arise personal beliefs and biases, which can shape the interpretations during the study (Creswell, 2014). In that sense, the researcher should be aware and flexible in his or her personal bias, values and background during the interpretation of the study.

4.1 Description of Research Sites

In this study six museum settings were studied. The sampling was not random (Bryman, 2012) but conducted to show the diversity of the museum collections in Sweden. Moreover, this variation was intentional, with the goal to represent museums' different guiding approaches and focus as well as to describe various exhibitions and educational staff. In addition, it was decided by the researcher to include different types of museum environments in order to raise issues relevant in other museums disciplines and provide common patterns of educators' pedagogical practices and beliefs that could be applied more widely.

Museums attract many visitors in Sweden. In the Swedish cultural context, there is an increase of nearly a million visits to the hundred and sixty-six museum institutions and the museums activities planned for children and youth are nearly thirty-nine thousand. Moreover, half of the museums have specific objectives, which have also been evaluated for their educational role (The Swedish Arts Council, 2009¹). This emphasises the educational role of museums, which has risen even further in significance.

¹kulturradet.se The Swedish Arts Council (Kulturrådet) is a public authority under the Swedish ministry of culture.

A description of the sites is presented in Table 1. This description involves detailed information about the focus and purposes, the activities, the exhibitions and the visitors' patterns age of each museum participating in this study. This description intends to present basic information, which can generate themes or patterns (Creswell, 2014). In addition, these detailed descriptions are appropriate for case studies that support "rich descriptions and details" (Yin, 2009, p. 18 as cited on Cohen et al., 2011) to understand people in their context and to understand their practices. This information was used because the aim of this study was to seek common patterns in the museums and the museum educators (rather than to make comparisons of individual backgrounds, experiences, gender, age or museums exhibitions, focus and aims). The museums' information, as described by their web sites and staff, is presented in Table 1. All the museums included in this study provide educational programs and are visited by thousands of students per year. Although, they describe different disciplines and exhibitions, they represent learning activities and focus within the museum field.

4.1.1 The Botanical Garden

The Botanical Garden has a growing education department which works with outdoor education for both children and adults. Every year approximately ten thousand students take part in different activities in the garden. The Botanical Garden has a new educational area where school children can take part in gardening programmes.

4.1.2 The Science Centre

The Science Centre represents an opportunity to explore a quite different environment with a combination of various contexts from that of the botanical garden. It is a popular and innovative science centre and offers a range of exhibits and a variety of topics, including animals, nature, technology and experiments.

4.1.3 The Natural History Museum

The museum features zoological collections, with over ten million animals. It also shows the structure of the earth and the history of life. The museum offers experience-based learning through dialogue and workshops (according to the educator). The museum's educational activities focus on the advancement of scientific knowledge, including science, religion and gender issues for example.

4.1.4 The Aquarium

The Aquarium explores life under, above and by the sea. It is a popular family attraction and includes different exhibitions and an aquarium. The Aquarium aims to stimulate interest and commitment to the endangered marine environment through guided tours and ongoing research.

4.1.5 The Museum of Arts

The Museum of Art's features a context quite different from that of the previously mentioned institutions. It holds an art collection from the 15th century until the present day. The museum's educator stated that, "one of the most significant goals of the museum is to create a positive relationship with art for children and adults through different workshops". Thus, with these activities the museum wants to provide tools for art experience and stimulate critical thinking as well as imagination.

4.1.6 The Museum of Arts, Crafts, Design and Fashion

The Museum of Arts, Crafts, Design and Fashion is a museum focused on design, fashion and applied arts. The pedagogical focus of the museum is, according to its educator, to achieve a dialogue with the children and the pupils on contemporary phenomena and expression.

Table 1. Museum information.

Museums	Focus and purposes	Activities	Exhibitions	Visitors patterns age
The Aquarium	Focuses on ocean. Through guided tours and ongoing research. Aim to stimulate interest and commitment to marine environment	Visitors can get up close to some of the fish and other creatures in the Aquarium's Touch pool.	Nordic water and Tropical water	All ages from preschool up to upper secondary school
The museum of Arts	Focuses on working in a form of dialogue with students, create open environment, encourage individual experience and expression in speech and creative work.	Museums activities aim to include everyone in the common cultural heritage, provide tools for art experience, stimulate critical thinking, imagination as well as give and receive new perspectives on art. The museum work in the form of dialogue and encourage individual experience and creative work	Collections from the 15th century to today. Dutch and French art, including works from Rembrandt, van Gogh, Monet and Picasso. Nordic art from the 19th century and temporary exhibitions	Primary schools, secondary schools, adult education, private schools and high schools
The Botanical Garden	Focuses on information and knowledge about the world of plants, the climate and biological diversity.	Outdoor education for children and adults	The Garden and the greenhouses from tropical rainforest to dry deserts	Lessons from ages 4 to adults
The Science centre	Focuses on animals, nature, technology and masses of experiments.	School visits based on the mission. A mission is an assignment in the nature sciences, engineering and mathematics. Different missions available for different grades	The Rainforest, The Ocean Zone, The Teknoteket, Mammoth, The Space, Water's Way and Deadly Beauties	Lessons for preschool to high school students.
The Museum of Arts, Crafts, Design and Fashion	Focuses on arts, crafts, design and fashion.	The museum offers a rich variety of guided visits, workshops, guided lessons, courses and activities that are directed specifically to schools and preschools. The museum's activities subject can be: art and photo, handicraft and crafts, fashion and design	Permanent exhibition of contemporary and Historic Swedish design, as well as temporary design and craft exhibitions	Lessons for preschool students to upper secondary students
Natural History Museum	Focuses on animal wildlife, earth and life	Interactive museum lessons; Use of the objects on display for comparisons and reinforcement with interesting facts. The museum's lessons subjects are: biology, environment and sustainable development, norms, ethics and values	The museum's large collections contain 10 million animals, 18000 skeletons, 18000 biological objects and more than 25000 photos from research expeditions etcetera	The educational activities are aimed mainly at schools and groups of children and young people

Note: The information provided from the websites of each institution and from the educators

4.2 Participants

Participants in this study were museum educators working in museums in Sweden. They were 'purposefully' selected (Cohen et al., 2011) to reflect different identities, disciplines and contexts within the museum environment and to support a better understanding of the research topic and the research questions (Creswell, 2014). In addition, the participants and the sites have been selected to "achieve representativeness [...] to focus on specifics and to provide a greater depth to the study" (Teddlie and Yu, 2007 as cited on Cohen et al., p.156). Furthermore, the purposive sampling intended to approach 'knowledgeable people' who have "in-depth knowledge about particular issues [...] maybe virtue of their professional role [...] expertise or experience" (Ball, 1990 as cited on Cohen et al. 2011, p. 157). The number of the sites and participants were selected based on Creswell's (2014) suggestion that case studies should include five to four cases. In addition, the six professional educators were selected according to their availability and interest. All six educators are working full-time in the museums and they are responsible for the educational part of school and public visits.

To gain access to each museum 'gatekeepers'(Creswell, 2014), individuals of each site who can provide access to the settings and allow the research to be done, were contacted. In this study, the educators of each museum were contacted by sending a letter of invitation via email, in which all the information about this study was explained. The interviews were conducted in each participant's museum site and the duration of each interview varied between twenty and thirty minutes (guiding research protocol, Appendix 2). The semi-structured interviews included open and closed questions. Semi-structured interviews were selected as a flexible and productive research tool that enables a 'naturalness' (Gillham, 2000a). Additional data tools during the interviews with the participants were collected in the form of photographs (Figure 1 and Figure 2). This process allowed the researcher to make connections between the topic discussed and the participant. Figures collected to support and visualise some of the examples that educators used during the school visits.

4.3 Data collection

The study utilised semi-structured interviews led by open-ended questions. The semi-structured interviews allowed a more flexible and natural interview process (Gillham, 2005). In this study, interviews have been used as the main data collection tool that has examined educators' perspectives on museum learning, pedagogical practices and roles in non-formal settings.

Cohen, et al. (2011) argue that interviews can be seen as “a flexible tool for data collection [...] and powerful implement for researchers” (p.409). For instance, in this study through carrying out interviews it was possible to prompt participants' interpretations and explanations about their pedagogical practices during the school visits. Interviews as a method of data collection reflect on interviewee's knowledge, on their perception of the social world and of each other (Cohen et al., 2008). But, this means that the understanding of the phenomena in question reflects on the complexity of the social reality (Kvale, 1989). Also, it is constructed and delivered to “provide an intensive, detailed examination of a case” (Bryman, 2016). In addition, the use of interviews as a research tool in the study emphasizes the centrality of human interactions in the generation of knowledge (Cohen et al., 2011). Moreover, an interview allows participants to discuss the way they interpret the world and to express their personal opinions about situations as part of their life experience (Cohen et al., 2011). Furthermore, one of the strengths of the face-to-face interview “is the ‘richness’ of the communication that is possible” (Gillham, 2000b, p.62).

Interviews can also be very time-consuming; they can be interpreted in many ways and it may be difficult for the participants to respond. Nevertheless, any kind of bias that may occur can be eliminated through a thorough planning of the research design and by the skills of the interviewers. The subjectivity of the role of the researcher within the context must be acknowledged. In this study, an attempt has been made to identify the researcher's personal biases, values and background and make the participant's meaning the focus of the research. This requires that the researcher should

“build more inclusive ways to discover the multiple views of the participants and to adopt more personally interactive role” (Mertens, 2015, p.264). For instance, the use of prompts supported to elicit more detailed and complex perspectives, meaning and information of the educator’s every day practice during a school visit. In this case, the purpose of the interviews with the participants was to gain a better understanding of how the visits in the museum settings were situated within the pedagogical goals of each museum. These interviews helped build up a theoretical context of a visit and to present educator pedagogical approaches and profession.

The questions explored three aspects: the content and the structure of a school visit including the planning before, during and after the visit; educators’ pedagogies during the visit regarding activities and interactions (such as conversation, questions and object learning); educators’ perspectives within the museum field regarding their role, functions and profession. The interviews were recorded and transcripts of the interviews were used for further analysis and interpretation. A written protocol was also available for guidance and references.

4.4 Data analysis

The study carried out a content analysis. This means that the substantive content of the interviews was organised in order to “capture different dimensions of meaning and so could be represented by different category headings” (Gillham, 2005, p.137). There are two stages:

1. Identifying key statements
2. Putting them on categories

The audio-recorded interviews were transcribed and coded. The coding process involved the summary and the categorisation of all the research material into particular categories (Gillham, 2005). Through the coding of each interview transcript the researcher “search for repetition of these sequences of coded text within and across cases” (Bryman, 2012, p.13). All the codes were organised

and written into the appropriate segment of the text in order the researcher to make sense of the data (Creswell, 2014). This organisation reflects on “the general significance of what people have said” (Gillham, 2000b, p.73). Direct quotations were used to highlight the substance and the meaning of the participant's responses (Gillham, 2000b). The collected data processed and coded into categories in order to address the research questions as well as to highlight the educational constructivist and sociocultural views of learning in museum settings.

The active participation in the process of learning with the social interactions between students, educators and the exhibits is considered to enhance learning in museum settings (Dewey, 1938; Vygotsky, 1978; Falk and Dierking, 2013).

In this study, the purpose of the data analysis was to “seek to identify and describe patterns and themes from the perspective of the participant(s), then attempt to understand and explain these patterns and themes” (Agar, 1980 as cited on Creswell, 2009, p.199). Therefore, the information about the nature of the school visits and their perspectives regarding the role and the functions of museum educators was categorised as follows:

1. Educators' perception about the nature of learning in museums
2. The structure of a visit, before, during and after
3. Educators' pedagogies during the visits: activities and interactions that support learning
4. Educators' perspectives about their roles and functions
5. Educators 'perspectives towards their profession

The aim of this categorisation was to compare where museum educators' experiences reflected that of the existing literature as well as indicate the use of pedagogical practices within the literature's suggestions for supporting learning in out of school settings. In addition, categorising allowed for reflection on whether common patterns could emerge from the data and be applied to the profession of museum educators.

4.5 Limitations and Ethics

Although the nature of generalisation in case study is difficult to clarify, it is important to indicate that, “case studies opt for an analytic [...] generalisation, that is they develop a theory which can help researchers to understand other similar cases, phenomena or situation” (Robson, 2002, p.183 as cited on Cohen et al., 2007, 254). Therefore “case studies can make the theoretical statements [...] but these must be supported by evidence presented” (Cohen et al., 2007, p.254). With this perspective, in this study the evidence emerged from the review of the existence literature and the interview data.

Also, “it is important in case studies for events and situations to be allowed to speak for themselves” (Cohen et al., 2011, p. 290). The validity in this case is allowed within the case study in terms of authentic experiences and voices of the interviews. The qualitative methods aim to understand the meaning of what people say and do (Gillham, 2000). Hence, the context of the case is unique and “enable boundaries to be drawn around the case which can be defined by participant’s roles and function in the case” (Bryman, 2007, p.254).

Issues of the objectivity of the interview knowledge may arise. Yet, the ability of the researcher to choose among the interpretations, to communicate the findings and to present relative or alternative arguments can provide internal validity (Gillham, 2000).

Another issue could be the question of the diversity of identities in the study. More specifically, considering the different educational backgrounds of the participated museum educators, the question of whether the educators function as scientists or as educators should be included. The different disciplines of the participants (scientists, curators or teachers) within the different contexts (science, art, design) create a complexity of variables under the study. For instance, during the interviews, three of the educators stated that they do not have scientific knowledge about learning, but instead they referred to their own personal and professional experiences. Allen and Crowley (2014) con-

clude that research studies have identified evidence for museum educators following epistemologies and pedagogies with which they are already familiar from previous learning experiences in non-formal settings.

Qualitative research addresses the importance of ethical considerations since it involves personal and sensitive matters (Cohen et al., 2011). First and foremost, the researcher should respect and protect the dignity and the interests of the participants at any time (Cohen et al., 2011), the research has the obligation to provide trust and confidence to the participants (Gillham, 2000b).

Interviews have an ethical aspect as they include information about complex human experiences and the researcher is involved in interaction with participants (Cohen et al., 2011). Respectively, the content matter of this study included personal beliefs related to the work environment, and there was a potential that some participants may feel uncomfortable to present their own experiences. However, the participants had been informed through a letter of consent about the purposes of the research, the content of the study and their right to withdraw at any time. In addition, the issue of confidentiality was explained to each interviewee in relation to who has access to this information and for what reasons (Gillham, 2000b). Each participant in the study was given a pseudonym in order to maintain their anonymity. The Swedish Ethical issues and guidelines for research were checked and no particular objections are addressed.²

² codex.vr.se CODEX is the Swedish rules and guidelines for research

CHAPTER FIVE: FINDINGS

This chapter section reports on general patterns of the visits at six museums, based on interviews conducted with six museum educators. The results of the data analysis will be divided into five different categories. The categories will be presented in the following order:

1. Educators' perspectives of learning in museums.
2. The structure of the visit.
3. The educational practices of educators during the visit: activities and interactions that support learning
4. The role and functions of museum educators.
5. The profession within the museum field.

The intention of this categorisation aims at addressing the research questions:

- a) How do museum educators structure their visits?
- b) Which are the pedagogical approaches used by museum educators to support learning during a school visit? Sub-question How do museum educators use activities and interactions during the visit?
- c) What is the role and which are the functions of museum educators?
- d) How do educators perceive their profession within the museum field?

Pseudonyms are used to protect participants' identities. Educators will be given different names, considering the participant's gender; Hanna (Botanical Garden), Bill (Aquarium), Kate (Science Centre), Lena (Natural History Museum), Fiona (Museum of Arts) and Thea (Museum of Arts, Crafts, Design and Fashion).

5.1 Educators' perspectives of learning in museums

To understand the practice of educators in museums, educators were asked to define and identify learning in museums from their own professional experience.

5.1.1 Hanna – Botanical Garden

When Hanna was asked to give her own definition of learning in museums she referred to the fact that since museums do not have school classes coming back, it is difficult to evaluate the learning outcome. Therefore, she thinks that the most important thing for her is children having fun and enjoying the visit. She also referred to the role of the institution towards learning in museums, she said that there is a new director in the botanical garden who is very interested in the education and that helps advancing the learning possibilities. More specifically, “due to the new director, which has made an extreme change, the people in the garden [editorial note: the museum educators and the director] are very interested in education”.

5.1.2 Bill – Aquarium

Bill argues that what makes a museum unique is the objects and the exhibitions that are displayed. Students have the opportunity to look at an aquarium, this is an opportunity that they cannot have at school. “All the things in a museum makes it a unique place”. Bill argued that one of the educators' goals is to get as many schools as possible to come because they want to educate people about the marine environment. He also pointed out that they do not see themselves as schools but as something that can work closely with the school system. He argued that they do not have a formal lesson like in schools but they place teaching in the museum context, which in this case is the aquarium.

5.1.3 Kate - Science Centre

Kate states that being in a science centre you can experience a concept while you are touching it or feeling it. It is easier for children to understand scientific concepts when they can experience it though the living parts in the museum, such as the rainforest and the aquarium. “When children

come here they can understand what it is all about, because they can experience it. They can be in a rainforest; they can be in an aquarium [...] and they can touch and feel". Kate believes that when children are able to use their senses and actively engage themselves with a concept, the learning is easier for them. Kate also indicates that there is a difference between learning that take place in museums and learning in the school.

5.1.4 Lena – Natural History Museum

Lena thinks that children learn in museums because as a non-formal environment museums offer experiences with authentic material whereas school do not have this possibility. She also believes that when children experience learning through their senses, they get a better understanding, "A real sense of how big an elephant is or how tall a giraffe is [...] or the difference between a fox living in the desert and a fox living in the arctic areas [...] becomes much more clear when you can see it, feel it and touch it."

5.1.5 Fiona - Museum of Arts

Fiona stated that as an educator she wants people come to the museum and experience the art themselves. For her, art can become a medium to express oneself. She uses questions as a tool to make students broaden their perspectives, to make them analyse and discuss the objects in the exhibit. For Fiona, the most awarding thing is when she sees that children, through conversation, grow and acknowledge themselves and each other and experience new things during the lesson.

5.1.6 Thea - Museum of Arts, Crafts, Design and Fashion

Thea argues that museums need to find a balance between being an educational institution and environment that promotes creativity and inspiration. She, as an educator, seeks to inspire creativity and focuses on learning design fashion and applied arts. In addition, she believes that different people react to things differently and that people learn different; by doing, by acting, by listening, etc.

5.1.7 SUMMARY

Museum educators were asked to define learning within their professional museum experience. Their definitions included interest, fun and inspiration as important aspects that lead to learning opportunities. Findings showed that, two out of six museum educators (Hanna and Lena) focused on learning in museums as a fun and interesting experience. Three museum educators (Kate, Fiona and Thea) referred to museum as a place that can inspire children. All the educators mentioned that the museums are educational institutions that want to spread knowledge. Overall, the interviews' findings indicate a dichotomy between fun, knowledge and inspiration as objectives. Table 2 presents the perspectives of museum's educators towards learning in museums.

Table 2. Museum perspectives towards learning in museums.

Enjoyable and Fun	Knowledge	Inspire
<p>“I want them to come away from here and say, 'we enjoyed that' and hopefully see something exciting in the plants, the nature that would make them come back.”</p> <p>Hanna, Botanical Garden</p>	<p>“I think our most important asset is the deep knowledge amongst the staff about biology and marine science and then it will get very interesting for the children because our staff know so much about all the animals.”</p> <p>Bill, Aquarium</p>	<p>“We do not have to teach anyone anything, it is more like inspiration, because if you are inspired by the fish and the coral reef and you want to keep the reefs alive, I can show them the beauty about that and I think they will learn a lot [...] could just inspire them and hopefully they will learn a lot, I am sure they do.”</p> <p>Kate, Science Centre</p>
<p>“I think it should be something fun. Here in the museum we teach experience-based education and I like that because good experiences lead to learning without the people even noticing that they are learning things.”</p> <p>Lena, Natural History Museum</p>		<p>“Learning art is like you are able to connect to yourself, the art can become the medium.”</p> <p>Fiona, Arts Museum</p>
		<p>“It is to inspire creativity in museums but I think we need to find a balance between the educational and inspirational role of the museums.”</p> <p>Thea, Museums of Arts, Crafts, Design and Fashion</p>

5.2 Structure of a visit

To address the first research question regarding the structure of a visit, museum educators were asked to describe the structure of a school visit: before, during and the end (evaluation and follow up lessons). In addition, the interactions between school teachers and museum educators during the visit as well as the context of the guided-visit including descriptions and examples of the visit are presented below.

5.2.1 Before the visit

5.2.1.1 Hanna – Botanical Garden

Hanna stated that they have a lot of different programs in the botanical garden: the school gardening program, the gardening project, the science festival, etc. The structure looks different depending on which theme is under consideration. Hanna describes the school program which she does in a daily basis. Hanna stated that she tries to connect the museum's themes to the school curriculum, such as organic farming, compost and photosynthesis and she tries to encourage teachers and children to use gardening as a tool in the curriculum.

5.2.1.2 Bill - Aquarium

In a similar approach Bill argues that he tries to make the connections to the curriculum as a service to the teachers. He, with his group, try to develop different lessons that can be connected to the curriculum so the teachers can achieve the curriculum goals. But, he also believes that this is a way to attract a lot of teachers and children to teach them about taking care of the marine environment which is one of the goals of the aquarium. He stated that this approach works really well for both the educators and the teachers". Bill said that when they are doing the connection with the curriculum they work together with school teachers that are more familiar with the curriculum: "For example we had this exhibition called 'Plastic Debris in the Ocean, Plastic Problem?' and we wanted to develop this really good program of lessons for it, so we invited an active teacher to help us do

these connections with the curriculum. The teacher can help us to connect all these things from the curriculum". He also added that is a strategic way of working, by bringing teachers to help the staff (between five to ten people doing the same lesson) to develop a lesson.

5.2.1.3 Kate – Science Centre

According to Kate, everything they do is connected to the curriculum. This is the way they work in the museum. The planning is between educators. Before they develop any lesson, they look at the curriculum, "First we start with an age group, then we look at the curriculum for that age group, and then we start to develop the lessons". Kate gives an example about how they decide what they want to do, "For example, if we are doing a lesson with the rainforest we want to have something about environmental questions, when we have decided what we want to do we look at the curriculum". One of the reasons why they design lessons supplementary to the curriculum is because they want children to have the opportunity to engage with the exhibits and collections, which is not possible at school. She also stated that connecting the lessons with the curriculum is a way to motivate teachers to come.

5.2.1.4 Lena – Natural History Museum

Lena said that they have thirty different lessons that the teachers can book and all their lessons are based on the curriculum. She also described the structure of a visit, "It starts with an introduction and then we do the activities and then we have a discussion at the end".

5.2.1.5 Fiona – Museum of Arts

Fiona said that the planning begins before the teachers book the lesson. Teachers can choose time and date and they can look at the description of different topics from the museum webpage. Fiona explained that they try to work more with connecting their topics with the curriculum. They have a set of standard lessons that can be connected to the curriculum. For example, "In the art classes in school they have to learn to interpret an image and we have a lesson called 'Art-Analyzing'. This lesson helps students to learn how to look, 'break down' and interpret a picture. This lesson sup-

ports children to get familiar with art". She claims that they have fifteen different topics. This is so the children can have the opportunity to see the different exhibits and collections that are displayed in the museum; old objects, new objects, paintings, sculpture and video art.

5.2.1.6 Thea – Museum of Arts, Crafts, Design and Fashion

Thea said that they have different lessons that require different structure and planning. Thea and the other two museum educators use the curriculum and they have a teacher reference group who meet. They meet with a teacher reference people once a month together with other museums. This process enables educators to discuss with other educators and the teachers about curriculum connections and the challenges that they may face during a lesson.

5.2.2 During the visit

5.2.2.1 Hanna-Botanical Garden

Hanna stated that she uses the introduction to address information to the students about what is going to happen during the visit, "When students arrive I tell them about the agenda of the day and all the practical information about the visit. It is very important to us that there is an introduction so they know what is going to happen during the visit".

5.2.2.2 Bill – Aquarium

Bill said that that they start with the introduction, which lasts about ten minutes. He explained that the introduction is setting the stage and connect the children with what they are going to talk about. During the visit, they talk about animals, the ocean, the people who work at sea and the environment. Then, they gather around the aquarium as a group while the educator shows to them examples of the sea life. In the aquarium, they have lessons about marine environment, marine environmental problems or evolution.

5.2.2.3 Kate – Science Centre

Kate provides a description of a typical introduction to the aquarium hall in the science centre: It illustrates how the educator structures a visit related to science. The tour was a structured, educator-led experience. The educator engaged the exhibitions displayed to support learning. The educator and the students moved together as a whole group:

Aquarium Hall: A Guided Introduction

“It starts with life in the sea and in the ocean so we gather the children around and we sit down. We welcome them and introduce ourselves. I am in front of the aquarium so the children all look at the aquarium behind me. We start with what they see, the fish, and from there I have decided for example to talk about a certain topic, so I will have models to show and maybe they can point the fish out. For example, I start with the big aquarium which we call “Västkustakvariet” (The West coast aquarium) with the Swedish fish. We talk about them for a while and then move on, until we eventually get to sharks. After that I move with the group.”

5.2.2.4 Lena – Natural History Museum

Lena provides a description of a typical school visit at the Natural History Museum: The description below indicates how one educator structures a visit related to science.

Structure of a visit: Typical school visit at the Natural history museum

“I introduce myself in the entrance. Then I give information to students about what they are going to experience, see and do. Next, we go to the exhibition and I show the students different animals. Sometimes we ask the students to sit on the floor, especially the younger ones. Then I introduce students to a variety of objects such as furs, bones, etc. I allow students to touch all the objects. This is a typical school visit but we can adjust it depending on the students' age.”

5.2.2.5 **Fiona – Museum of Arts**

According to Fiona every visit starts with an introduction in the entrance of the museum. The structure of a visit is not always the same because she believes that the educator should listen to the needs of students and make the appropriate adjustments. They have a guided tour for thirty minutes and then they usually go to the studio, where they can continue with their activities. For example, if a group is having difficulties to concentrate, then the introduction can be a bit shorter so the group can move faster to the main exhibition. This also depends on the age of the group. Fiona said that the focus during a lesson is not to tell people about the artist. She wants people coming to the museum to experience the art through themselves. This process involves engaging students to conversation and questions, such as:

- What do you think about this?
- How did people view this at the time it was created?

However, she said that if the children ask about the artist, then she can reply to the specific question but it is not the focus of the visit. The museum has different exhibits which includes paintings, sculptures and video art.

5.2.2.6 **Thea – Museum of Arts, Crafts, Design and Fashion**

Thea believes that the introduction should be adjusted to the children's' mood and age. She argues that they always start with an introduction but the structure or the length of the introduction varies. For example, she said that, "When I meet small children, the first thing I want is to know their names because I want to be able to interact with them, I want to be able to speak with them, if I don't know their names I would be pointing at them the whole time so I try to learn their names." Next step is to introduce herself and the museum. Her focus is the exploration of the museum together with the children.

5.2.3 End of the visit: evaluation and follow up lessons

5.2.3.1 Hanna-Botanical Garden

Hanna said that at the end of the lesson she goes through what they have done. She explained that this is a way for educators to get a feedback and help improving the lessons. She believes that the introduction and the recap in the end are very important parts of the visit. These are some of the questions she asks for additional information or personal reactions:

- What have you learned today?
- What do you think was the most fun part of the lesson?
- What do you think was the most boring part of the lesson?

However, Hanna admits that they rarely have follow-up lessons with the classes. Thus, she explained that it is difficult to measure the learning outcomes.

5.2.3.2 Bill – Aquarium

According to Bill they have an evaluation form but they do not get much information. The evaluation form is a standardized form for all museums in the city. It is mostly only the teachers who fill out this form.

5.2.3.3 Kate – Science Centre

Kate said that they have evaluation. They ask both the teachers and students what they thought in the end of the visit. But she argues that they need to develop the evaluation even more.

5.2.3.4 Lena – Natural History Museum

Lena stated that they do not have follow-up lessons in the museums. This is because a lot of groups want to visit the museum. In order to get as many different classes as possible, she claims that they made a conscious decision to let every class visit them one time per semester. In that way, they give the possibility to more classes to come and visit the museum.

5.2.3.5 **Fiona – Museum of Arts**

Fiona said that they do not use any kind of a formal evaluation. But, many teachers visit the museum more than one time per semester for different lessons, so this is a way that they can follow up as many times they want.

5.2.3.6 **Thea – Museum of Arts, Crafts, Design and Fashion**

Thea claims that they do not have any follow-up lessons or evaluation between children and teachers. Hence, she claims that when same groups come back for a lesson or same school visiting with different group, that indicates that they were satisfied with the visits, "If the teachers were not happy with what they see then they would have not come back".

5.2.4 **Interactions between school teachers and museum educators**

5.2.4.1 **Hanna-Botanical Garden**

During the visits, the teachers are always with the educators. However, she said that some of the teacher prefer to step back during a visit although most teachers are engaged in the lessons. Sometimes, if the teachers are interested, they can have email contact with the educator before the visit. She indicated that she can talk to the teachers about certain topics that they are going to mention in the lesson.

5.2.4.2 **Bill – Aquarium**

Bill expressed that, "Few teachers really work together with us". He states that most of the teachers do not contact them but they just book the lesson. However, in a few cases the teachers get in contact with them on telephone or via email and then they can discuss how to plan the lesson.

5.2.4.3 **Kate – Science Centre**

Kate said that teachers sometimes ask questions through email so that they can get prepared at school.

5.2.4.4 **Lena – Natural History Museum**

Lena stated that they always have communication with the teachers before the visit. This is important for Lena because when the teachers know what they are going to talk about during the visit, they can introduce the children to the topics beforehand at school.

5.2.4.5 **Fiona –Museum of Arts**

Fiona did not mention any communication before the visit with the teachers.

5.2.4.6 **Thea – Museum of Arts, Crafts, Design and Fashion**

Thea indicates that the communication with the teacher and the museum depends mostly on how much teachers want to get involved in the visit. She explained that there are teachers that just book the lesson and others ask questions about the lessons or ask if they can connect specific museum topics to the curriculum. Thea gives an example, “The second grade of a school comes every year here because they work with the theme ‘Artefacts’ and they have asked us to do a lesson that could be part of their work. So, we suggest a lesson (to the teachers) especially designed for them to talk about artefacts with the children”

5.2.5 **SUMMARY**

Overall, interview data showed that the majority of the museum educators connect or try to connect their themes to the school curriculum to attract the school teachers and the students to visit the museums. The structure of the visit provided information related to the museum's themes and engaged students in discussions about the exhibits through questions, conversation and a variety of objects. However, educators stated that they can modify the structure of the visit to assist personal interests of students about an exhibit.

In addition, the data of this study indicated that educators start the visit with an introduction. During the visit, in some cases students, teachers and educators were moving together as a whole group or gathering around the exhibition which was related to the focus of the lesson. At the end of the visit

interview data showed that educators did not have follow-up lessons with the school classes and the evaluation of the visit between the students and the teachers was evident only in two museums.

In addition, educators indicated that communication between them and school teachers during the visit was limited. Further, educators stated that in some cases school teachers contacted them to book the visit and connect the museum activity to the school experiences. Table 3 presents the structure of a visit as described by the museum educators in the six participating museums.

Table 3. Structure of a visit.

	Before (curriculum connections)	During	End (follow-up lessons and evaluation)	Museum educators' connections with school teachers
Hanna-Botanical Garden	Encourage teacher and students to use gardening as a tool in the curriculum	Introduction: addressing information about the visit	Rarely follow-up lessons (specific programs)	During the visit, they step back
Bill- Aquarium	Encourage school teachers and students to visit Work together with teachers to connect curriculum goals to museum themes	Introduction: setting the stage Talk about animals and ocean Gather around the aquarium Examples of sea life	An evaluation form standardized for all museums. They do not get much information. No follow-up lessons	Few teachers work with them during the visit
Kate-Science Centre	Everything relates to the curriculum Children can engage with exhibits and collections	Gather children around in front of the aquarium Talk and point the fish out Walk to other areas	Evaluation: They discuss both with teachers and students No follow-up lessons	Teachers ask questions through email contact
Lena-Natural History Museum	They base all their lessons on the curriculum	Introduction: information about the visit Walk around Introduce students to different objects Lesson adjusts depending on the age	No follow-up lessons	They have communication before
Fiona-Arts Museum	Try to work more with connecting their topics with the curriculum It is a way for children to have the opportunity to see different exhibits and collections displayed in the museum	Guided tour (10 minutes) Go to studio-where children continue with their activities Lesson adjusts depending on the age	No follow-up lessons or evaluation with teachers and students	No communication
Thea- Museum of Arts, Crafts, Design and Fashion	They connect their topics to curriculum It is a way for children to have the opportunity to see different exhibits and collections displayed in the museum	Introduction adjusted to children's needs Introduce herself Explore the museum with children	No follow-up lesson or evaluation with teachers and students	Depends on the teacher

5.3 Educators' practices during a visit

This study has adopted educational constructivist (Dewey, 1938; Hein, 1998) and sociocultural theories (Vygotsky, 1978). The researcher used these theories to explore and recognize possible practices which may be used by educators in learning in museums. Thus, the second research question explored by examining whether the pedagogical practices employed by museum reflect on the theories mentioned above.

5.3.1 Hanna-Botanical Garden

Hanna claims that the activities usually take place outdoors. She said that activities are part of their method and that they always have an interactive part in their lesson. Examples of an interactive activities are presented below:

Activity: Children working in small groups

They try to find information about trees and plants. The educator provides them with specific material (see Figure 1). When everyone is ready, they gather all together in a room. The leader of each group presents the information that they found. The educator guides the conversation:

Hanna: Can the blue and yellow group leaders tell me which plan did you get?

Leader of the group: We have had the cinnamon tree

Hanna: Did you think about which part the tree is?

This is a typical example of how they work during a visit. Hanna supports that when children play



Figure 1. Cards with pictures and names of tree buds

they engage into interactive conversations which can lead to learning.

Activity: 'Hunting for Useful Tropical Plants'

First, the children get divided into different groups. Then they are presented with an object. This can for example be a jar containing spices. The jar is then marked with a colour code. The children do not know the content of the jar, but they are allowed to touch, smell and taste the content. The educator has then placed sticks in the exhibition with the matching colour code. The children then search for the correct plant using the colour code which also lets them learn where the plant comes from. When they then arrive at the plant, they receive instructions on a card, which can be the following:

Look at your plant, is there anything special about it?

Has it got any fruits or flowers?

What sort of plant is? An herb? A tree? A bush?

Which part of the plant do you think is used to make the product in the jar?

Activity: Indoor lesson during winter times (duration: 45 minutes)

The magnifying glasses are used to look at the details on the trees. The group then talk about specific trees of Sweden. The group is then handed a pile of tree buds and some cards with cartoon pictures and name of tree buds (see Figure 1). When the group has identified, which tree the buds are from, they go out and look at the tree in the garden.

5.3.2 Bill-Aquarium

Bill stated that what makes the visit unique in the museum, is the actual aquarium. He said, "If you have an aquarium people are always interested". In the beginning of a lesson he encourages the children to ask questions and he tries to get them interested. When he introduces the aquarium to the children, he wants them to connect their own experiences of the sea to the lesson. However, he stated that as an aquarium, they have living animals so they can touch few animals like the sea star and the crabs. Therefore, he asks questions about any previous experiences of the sea:

Bill: Have you all tried swimming in the sea?

Bill: Have you tasted the water? How did it taste?

Student: Oh! It is salty water

Below are some examples of activities and exhibits during a visit to the aquarium:

Activity: 'Role Play'

The educator gives children different tasks and roles. He tries to imitate the food chain. The children can be a herring, a fish and small shrimps. Then the educator describes the stages of the chain and try to engage children in conversation about what they think and how they feel.

Activity: The Touch Pool (Fig.2)

In the aquarium, they have a 'touch' pool (see Figure 2). One person from the staff brings a sea star and he or she lets children touch it and talk about it. This is the touch pool activity (klappa havet) and it is a very "hands on" experience. Bill argues that in the aquarium they try to use different senses, touching the animal, feeling it, the structure, the spines, etc., and maybe talk about it. They can see films and videos that highlight different aspects of its biology and then they can go to the aquarium which is the environment where it lives and show them how it looks in the ocean where this animal lives. A lot of their activities are really 'hands on' activities". In this example the educator use questions to invite further thinking about the sea star's biology:

BA: Do they have any eyes?

STUDENT: Is it an animal? Is it alive?

BA: Do you think it is an animal or a plant?

BA: Do you think it is breathing?



Figure 2. The touch pool of the aquarium

For Bill, asking questions is an educational tool. He claims that he tries to make a discussion with the children, make them reflect and have more questions, in that way he doesn't have to just deliver the right answer. In addition, Bill indicated that they have developed different exhibitions (exhibit 1 and 2) that engage students to work with experiments, investigations and games.

Exhibit 1: 'Marine scientists for a day'

Working with experiments and investigations. They have a lab in a part of the museum. In this lab, children can become marine scientists for a day. They can measure salinity, pH values and they can do their own investigations. Educators try to invite scientist to teach students their own research. They want children to have the opportunity to connect with real scientists and real experiments. This is an example of a 'hands-on' activity.

Exhibit 2: 'The Fishing Game'

This is a lesson that they developed for a special exhibition about the overfishing problem. For this fish exhibition, they worked together with a teacher for making the curriculum connections. Students fish in a sample pool and they get some instructions from the educators. Then, students can see that if they are fishing too much the fish will run out. Therefore, this exhibit was designed to show that when students were fishing less then fish stock was healthy and would not be depleted.

5.3.3 Kate – Science Centre

Kate supports that first she wants to get children interested about the lesson and then she can start inspire them to learn more. She claims that knowing the prior knowledge of a child is not relevant to how they work in the science centre. If she wants to talk about oceans, for example, and that they are becoming more sour because of the carbo dioxide, she would do it in a way that interested them and it is simple. Kate expressed that she does not have to teach children anything at the science centre. Kate stated that during the visits educators try to ask children more open questions.

5.3.4 Lena-Natural History Museum

Lena says that the educators usually begin with having a conversation with the children, “We always ask them questions about their prior knowledge and interest because these are the two factors that lead the lesson”. She also argues that conversation and questions are tools to know the child’s level of knowledge and start from there and then put more knowledge on top of that. In addition, conversation and questions are also means of getting to know the children on a personal level. She also argues that she thinks that, “questioning is a good teaching tool”.

According to Lena, activities during the visit allow interaction between children, such as working in pairs or discuss with each other. She claims that all the lessons are activity-based and they have a lot of material that children can use, touch and explore. For example, “If we talk about a bear, then the children have the opportunity to feel the bear’s hair and touch the skull”. She claims that they try to involve as many different senses as possible in the learning process.

They also have workshops where they can have activities in which they can use microscopes. For example:

Activity: 'Life and Leaf'

Students go outside and can collect small animals and insects living in the leaves. Then, they come inside to the workshop where they can use the microscopes. Next, they can look at the animals that they found outside. Towards, the end, the educator will provide students with information about these animals.

Lena says that a museum visit is a unique experience because it can offer experiences with authentic material whereas the children do not have this possibility in the classroom. She added that,

“It is hard to get a real sense of how big an elephant is or a giraffe is or the difference between a fox living in a dessert and a fox living in the arctic areas, it becomes so much clearer when you can see it feel it and touch it.”

5.3.5 Fiona – Museum of Arts

In the museum, you are not allowed to touch anything. However, Fiona stated that they have a studio where children can paint, draw, make collages and sculpts from clay, etc.

The lesson in the arts museum is based on content of communication and discussion in the group, so it is conversation based. She claims that she always encourages students to see more. This means, “When I show to the student a painting, I always try to use words to explain the different meanings of it and allow students to make their own interpretations based on new perspectives that I offered them”.

She focuses the attention of the lesson on conversation and she uses questions and the stories that to increase the students interest. Below is a description of a part of a lesson:

“I am usually quiet when we walk. Then I stop to a place and I show them something. Next, I ask them:

- ‘What do you think about this?’
- ‘Do you have any thoughts?’
- ‘What comes to your mind when you see this?’
- ‘What do you think is about?’

Then they start to talk. I tell them specific stories that they are funny and suddenly they are more interested. I am trying to show them the stories behind the work which are interesting and it can open their eyes.”

Fiona supports that the level of interest amongst the children leads the focus of the lesson. For example, if the children seem more interested in a certain topic, Fiona will adjust the lesson's focus to that topic.

5.3.6 Thea - Museum of Arts, Crafts, Design and Fashion

Thea claims that when a group visits the museum she asks them questions to find out information about their previous knowledge. Depending on the age she can ask students:

- Have you been to a museum before?
- Do you know what a museum is?
- Do you know what design is?

Next, she gives information about the museum and about the specific collection in the museum.

Thea said that they have different activities for different lessons. The museum has a studio where children can work ‘hands on’. They had exhibitions with ceramics and they had invited a designer to work with children using tape. Thea also claims that parts of their lessons in the museum are object-based. She gives an example:

Activity: Artefacts

This lesson is for children two to nine years old. The educator starts the lesson by giving to the children an object. Children do not know what it is but they can touch it, smell it, get to try it (if possible). Their task is to figure out what it is by using their senses. Then, the educator use questions to help children to find out what the object. Some of the aiding questions are:

- What do you think it is?
- Why do you think it is that?
- In which room, would you place it in your home?

Next, they get to explore it for ten to fifteen minutes more. Afterwards, the educator gives them the answer and they can talk about it for a while. Then the group moves to another room where they sit in front of a cabinet. The educator asks children to interpret the object and say what they think it looks like.

Thea indicates that in the museum they do not have so much interaction for the children. But, she points out that when the educator meets with the children during the school visit, then the educator can bring examples for them to touch. However, when children come without an educator, they cannot do any of that. She continues that, there is nothing in the exhibitions to touch, they only have that possibility in the studio but it is not always available. Thea believes that introducing interaction into the exhibitions is a very important job for the educators, since this can lead to increasing the children's' interest.

5.3.7 SUMMARY

Educators were asked to describe their educational practices during a school visit. These practices included collaborative tasks developed during an activity. Hanna provided an example of an activity in which children working in small groups and she supported that when children play they engage into conversation which can lead to learning. Lena also indicated that she supports activities during the visit which allow interactions between children, such as working in pairs.

Conversation and questioning among students and educators was the most common strategy employed by educators to connect with students' prior experiences and interests (Bill, Lena, Thea, Fiona); as a guiding tool to communicate knowledge (Hanna), to encourage conversation about scientific ideas (Bill), to getting to know children in a personal level (Lena) and as aiding questions that help children to understand a concept or a topic (Hanna, Thea).

Museum exhibitions and objects were used by educators to enhance student's interest (Bill), to engage students into conversation which can support scientific knowledge and provide real examples of topics discussed (Bill) and as model of interpretation and further thinking (Fiona, Thea). In addition, two museum educators expressed that objects can offer experiences with authentic material (Lena; different animals in their actual size, Bill; the aquarium) which make the museum visit a unique experience.

Active learning was described by Hanna; she provided students with different objects such as jars, cards, magnifying glass in order students to identify different plants and trees, Bill; he describes an exhibition where students were working with experiments and investigations, Lena; they have workshops where children can have activities in which they use microscopes. However, Fiona and Thea said that students are not allowed to touch anything during the lesson, but thought questioning students are allowed to interpret the objects and make their own meanings of them (what do they think about it or what they think looks like). Thea indicated that they do not have a lot of interactions at the museum and that is something that they would like to develop.

Different senses were also employed by the educators during the visit. Hanna during an activity allowed students to feel, taste and smell the content of an object provided by her; Bill allowed students to touch a star fish, feel the structure and the spine; Lena use materials that children can use, touch and explore such as feel the bear's hair and touch the skull.

Overall, findings of this study suggest that educators use various strategies to support learning in museums, yet common patterns revealed constructivist approaches (Hein, 1998) which emphasizes the active participation of the child and sociocultural perspectives (Vygotsky, 1978) which recognizes social interactions, conversation and questions as processes that support learning. Examples of the interactions between museum educators, students and the objects displayed and the questions used by the educators to support learning in museum are presented in Table 4.

Table 4. Examples of the museums' educators' interactions with the students and the objects and questions during the lessons.

Examples of interactions with the students		Examples of questions
Hanna-Botanical Garden	<ul style="list-style-type: none"> • Children working in groups • Guiding questions • Conversation among peers • Outdoor or indoor activities 	<ul style="list-style-type: none"> • Did you think about which part the tree is? • Look at your plant, is there anything special about it? • Has it got any fruits or flowers?
Bill-Aquarium	<ul style="list-style-type: none"> • Questions • Connections with prior experience • Senses (touch sea star) • Experiments and Investigations 	<ul style="list-style-type: none"> • Have you all tried swimming in the sea? • Have you tasted the water? How did it taste? • Do you think is an animal or a plant? • Do you think is breathing?
Kate-Science	<ul style="list-style-type: none"> • Get children interested • Start with an experience (show children animals and plants) • Ask more open questions 	
Lena-Natural History museum	<ul style="list-style-type: none"> • Conversation • Questions prior knowledge and interested • Working in pairs • Different senses 	
Fiona-Arts Museum	<ul style="list-style-type: none"> • Conversation-based lessons • Questions, discussion and storytelling are used to increase interest • Studio - Where students can draw, make collages and sculpts from clay 	<ul style="list-style-type: none"> • What do you think about that? • Do you have any thoughts? • What comes to your mind when you see it?
Thea- Museum of Arts, Crafts, Design and Fashion	<ul style="list-style-type: none"> • Questions to figure out prior knowledge • Aiding questions to figure out a concept • Studio-Where children work 'hands-on' • Object-based • Senses 	<ul style="list-style-type: none"> • Have you been to a museum before? • Do you know what a museum is? • Do you know what design is?

5.4 Educators' roles and functions

Museum educators were asked to identify and define their role and functions in the museum.

5.4.1 Hanna – Botanical Garden

Hanna is the garden teacher in the museum. Hanna indicates that the role of the educator in a museum is of great importance. She argues that educators are specialists in their area and can offer something that the children are not able to get from school due to most teachers not acquiring the specific knowledge that they do. In the same respect, teachers prefer a guided visit because they believe that educators have a deeper level of knowledge. Also, Hanna said that teachers believe that educators can find the right examples to explain a concept because they are more familiar with the surroundings and every aspect of the exhibition.

Hanna claims that one of the educator's challenges is that he or she works with different groups every time, the groups could be different ages, new groups, families, public groups, etc. Also, according to Hanna, educators should have a passion about what they are teaching, about the subject and the place. In addition, Hanna said that they have evaluation among colleagues at the museum. At the end of each season they go through what they have done and recap over time.

5.4.2 Bill – Aquarium

Bill is the head of the aquarium and he is responsible for the school visits together with a group of people who are also marine biologists. He argues that they do not have any formal educator in the aquarium.

Bill indicates that an educator in the aquarium has a variety of responsibilities. The educators at the aquarium are involved in the planning of the lessons and the exhibitions. They take care of the aquariums, they build new aquariums, new exhibitions and they plan the school lessons. The focus themes are marine biology, marine ecology, and marine environment.

Bill argues that they have an evaluation among the educators at the aquarium. He explained that they reflect on how they can change their visits for the better and give feedback and tips to each other. However, he argues, since they have different responsibilities, it is hard for them to work more strategically with the planning and the evaluation. He suggests that it would be easier if they have a department with people working only with education.

5.4.3 Kate – Science Centre

Kate defines her role as an educator and developer of new material for school kids, teachers and the public, for everyone that visit. Kate indicates that a guided visit could be both good or bad. She explained that sometimes children need to explore and experience the museums by themselves. For example, “In the rainforest it could sometimes be disturbing with the guide because the guide would be the one who decides where to look. However, it could also be very good to have a guide with you if you have questions or if you want students to look at a certain object, so I think is both good and bad.”

Kate says that they have evaluation among colleagues in the museum every year and each time they want to develop a new exhibition. They reflect and discuss with each other. They also have test-classes, which try the new lessons of the museum and discuss with the educators about the lessons. She explains, “If we have developed something, we invite classes to try this new lesson and we discuss with the students and the teacher about it before we release it.”

5.4.4 Lena – Natural History Museum

Lena is working as the educator in the natural history museum together with two colleagues. She is responsible for the school classes that are visiting the museum. The lessons are about biology and animals. Lena defines the educator's role as a complement to the school. She argues that, “The teaching in school is good but a guided visit in the museum gives you a much deeper understanding because you can see the things you learn about in reality, to be able to touch and to experience”.

Lena also believes that the educators have a much deeper understanding of the museum context, “We can tell them [the children] about the animals and the exhibitions in a much-detailed way, we can help them see details that they would not see by themselves. Guidance is better.” She also argues that teachers believe that a visit with an educator is a better experience because educators are more familiar with the museum areas and subjects.

Lena says that they have evaluation and they plan the new lessons together. When they have developed a new lesson, they invite classes for test rounds. During the test rounds one of their educators is guiding the class and the other two educators are observing. After the end of the visit, they evaluate the lesson together and try to reflect on peoples' understanding of the lesson.

5.4.5 Fiona – Museum of Arts

Fiona is the art educator of the museum. Her role is to broaden perspectives of visitors. Fiona is responsible for the guided tours and for the schedule of the other educators in the museum. The museum has three art educators, but they also invite people from different art disciplines to do lessons.

She believes that a museum visit can be better when supported by the educators. This is because an educator can give more opportunities to see exhibits in different ways, so his or her role is to provide a deeper interpretation and allow an individual relationship to the art. Educators can address topics that many people do not think about when it comes to art, such as gender roles, class, economics and history. She pointed out that, “There are many layers and you can talk about every piece of art in like at least ten different ways, so if you meet us that is what we can give you, we can give you more perspectives”.

Fiona says that they evaluate their work regularly with her colleagues. Every time a new exhibition is finished, they discuss and reflect about it.

5.4.6 Thea – Museum of Arts, Crafts, Design and Fashion

Thea works as a museum educator. There are two other educators working with her full time. She sees her role as a bridge between people and the museum. She said that, “I can see that a lot of people are being nervous about coming to the museum, there is a resistance to come here, they don't want to come because they think that there will be nothing to do here”. Thea also believes that a museum educators should be the facilitator who inspire people and make them see the museum as an open space that invites everyone. She expressed that, “This is a big part of our job and I think that is why it is so important to work with children, because if you learn that when you are young then it is easier, when you become an adult you might not like it but at least you know what it is”. But, she also mentioned that one of the most important roles of a museum is to spread knowledge about their focus area. When Thea was asked if children learn in museums her response was, “Absolutely!”, however, she added that there should be a balance between guidance and children making their own meanings. Specifically, she said, “This is my dilemma. I think that children need to be guided, and we think that here in the museum we need to have a plan, we need to know what we are doing, what we are saying, what we want them to learn or explore during this visit” but also she pointed out that a visit needs to be flexible and be based on the children's needs and reactions, “what did the children react to, what does the visitor reacts to”.

Thea, addressed that educators face challenges, “If I want to show them this cabinet for example, but if the entire group is looking at something else then maybe I need to change and try to apply the things that I want to discuss towards another object that they found interesting.” Thea says that they have evaluation twice a year.

5.4.7 SUMMARY

Interview data revealed that educators have a variety of responsibilities. These responsibilities include planning the lessons for the school class and develop new exhibitions; Bill indicated that educators at the aquarium take care of the aquariums, build new exhibitions and plan school lessons;

Fiona said that she is responsible for the guided tours and the schedule of the other educators in the museum.

When educators were asked to identify their role in museums, most of them said that they found their role very important. There were however, nuances to their opinions and beliefs. Most notably, many talked about their positive influence of engaging children to the specific context; Hanna said that the role of educators is of a great importance because educators are specialists in the specific knowledge area and they can find the right examples to explain a concept because they are more familiar with the setting and the exhibitions; Lena similar said that she perceives the role of the educator as a complement to the school and she believes that a guided visit gives you a much deeper understanding because educators have a deeper knowledge of the museum context; Fiona also indicated that a museum visit can be better when supported by educators because they provide a deep interpretation and allow an individual relationship to the art; Thea suggested that the role of the educator is to inspire people and spread the knowledge. However, she also mentioned that a visit should be flexible and be based on the children's need. Kate similar expressed that a guided visit should be both good and bad.

In addition, Hanna and Lena highlighted that teachers also prefer guided lesson because they believe that educators have a deeper knowledge of the specific subjects and are more familiar with the museum environment.

Findings of this study suggested that educators evaluate their work among their colleagues, reflect on their practices, discuss and give feedback to each other (Bill, Kate, Fiona); According to Kate and Lena they invite test-classes to evaluate and reflect on the lesson together with the educators.

Overall, five out of six participating museum educators indicated that their role during a lesson is positive, promote a deeper learning and understanding of different meaning and subjects.

The interviews in this study with museum educators towards their roles and functions in the museum revealed various identifications of their role and functions. Their current role, the way they perceive their roles and functions and the process of evaluation of their work are illustrated in Table 5.

Table 5. Museum educators' current roles, perspectives of their roles and functions and the evaluation process.

	Current role in the museum	Educators' Roles and Functions	Evaluation among colleagues (other educators in the museum)
Hanna-Botanical Garden	<ul style="list-style-type: none"> The garden teacher 	<ul style="list-style-type: none"> Educators specialists Challenge as educators working with different group and ages 	Yes <ul style="list-style-type: none"> End of each season
Bill-Aquarium	<ul style="list-style-type: none"> Head of the Aquarium 	<ul style="list-style-type: none"> Responsible for the school visits Planning school lessons and exhibitions 	Yes <ul style="list-style-type: none"> Feedback and tips to each other
Kate-Science Museum	<ul style="list-style-type: none"> Educator and developer with new material for school children, teachers and for everyone that visit 	<ul style="list-style-type: none"> Guided visit: both bad and good 	Yes <ul style="list-style-type: none"> Test-classes
Lena-Natural History Museum	Museum <ul style="list-style-type: none"> educator 	<ul style="list-style-type: none"> Educators' role as compliment to school Deeper understanding Guidance is better 	Yes <ul style="list-style-type: none"> Test rounds
Fiona-Arts Museum	<ul style="list-style-type: none"> Art educator 	<ul style="list-style-type: none"> Educators broad perspectives Responsible for the guided tours Invite people from other areas Better guidance more opportunities for deeper interpretation 	Yes <ul style="list-style-type: none"> Discussion and reflection
Thea-Museum of Arts	<ul style="list-style-type: none"> Museum educator 	<ul style="list-style-type: none"> Educators facilitators who inspire people to see the museums an open space balance between guidance and learning 	Yes <ul style="list-style-type: none"> Twice a year

5.5 Museum educators' perspectives towards their profession

To address the research question towards museum educators' profession, museum educators were asked to describe any training for their professional preparation and the qualifications required to work as a museum educator in each specific museum participating in this study.

5.5.1 Hanna – Botanical Garden

Hanna has been working before in a natural history museum and she has fifteen years' experience in museums as an educator. Hanna said that there is no course for museum educators. However, she thinks that a museum educator should have a teaching degree. This is important because as an educator you should be familiar with curriculum demands of the schools and teachers. She argues that, "I have seen a lot of the people that I know through the years who work in museums, I have seen they have been changing them and is teachers coming in and taking the educational roles in museums where was before a person that had studied that particular subject".

5.5.2 Bill – Aquarium

Bill said that there is not any specific training for museum educators in Sweden. There is the term 'pedagog' in Swedish (educators) that is used for museum educators. Museum educators in the aquarium are qualified biologists, not educators. But he indicates that after the connections with the curriculum, all the staff in the museum that work with the schools have an internal education about how the lesson is supposed to be structured. However, he realises and identifies that they need teachers to make the connections with the curriculum.

5.5.3 Kate – Science Centre

Kate said that you to have a teaching degree and a degree in biology to be an educator in the science centre.

5.5.4 Lena – Natural History Museum

Lena said that in the natural history museum all the three educators are biologists with teaching background.

5.5.5 Fiona- Museum of Arts

Fiona said that when you apply for a job in the arts museum as an educator you should have at least a bachelor in arts or culture. She adds that everyone working here needs to know about art. People working in the museum as educators should know the subject.

5.5.6 Thea – Museum of Arts, Crafts, Design and Fashion

Thea said that she wanted to work with education in museums so she added pedagogical courses in her degree in art history because there is no education specifically for museum educators. Thea has been working as a museum educator for ten years in other arts museums.

5.5.7 SUMMARY

Museum educators' interviews in this study towards their profession demonstrated that there is no specific professional preparation for museum educators in Sweden; no course (Hanna) or specific training and education (Bill and Thea). In addition, interview data showed that educators working in each participating museum have a bachelor degree or master in biology or science (Hanna, Bill, Kate, Lena) or in art history (Fiona and Thea). Three out of six (Hanna, Kate, Lena) have also a teaching training background

Table 6 presents information about each participant, including their educational background, teaching experience and qualifications in schools and museums. Three educators were qualified teachers (Hanna, Lena, Kate) and the other three (Bill, Fiona, Thea) had no formal background in teaching in schools.

Table 6. Background information about the six educators who participated

	Educational background	Teacher training background	Teaching experience in schools	Teaching experience in museums	Age	Gender
Hanna Botanical Garden	Bachelor degree in Biology	Secondary teacher	Yes	Yes, she worked Natural History Museums She has 15 years' experience in museums	40+	F
Bill Aquarium	PhD in marine biology	NO	NO	NO	40+	M
Kate Science centre	Bachelor degree in science and biology	Teacher education grades 4-9, secondary education	Yes, she worked 5 years as a teacher	NO	40+	F
Lena Natural History Museum	Bachelor degree in biology	Teacher	Yes, she has been working in a school before as a teacher for around 10 years	NO	40+	F
Fiona Museum of Arts	Bachelor degree in art history (In Swedish Fil. Kand)	NO	Yes, working with youth between 11-18 years' old	NO	20+	F
Thea Museum of Arts, Crafts, Design and Fashion	Bachelor degree in art history and master degree in art history	NO	NO	She worked 10 years with few pauses. Also, she worked at another art museum.	30+	F

Note: All names of the educators are pseudonyms which represent the gender of the individual

In the next section, the discussion opts to link with the literature and situate the findings of this study. Also, it discusses across the participants' findings to provide a holistic understanding of the data.

CHAPTER SIX: DISCUSSION

In this chapter, previously presented findings will be discussed. Common patterns from the collected data of the six museum educators will be identified and compared with the literature discussed in the literature review chapter. The categories, embedded in the present subtitles, which have been previously used when presenting and reflecting on the findings will be used to structure the discussion and answer the research questions outlined on pages 2 and 35

6.1 Educators' perspectives towards learning in museums

In order to explore the educational practices employed by the museum educators, their perspectives towards learning should be examined. Hein (1998) supports, "that educational practices reflect the beliefs of the staff and the larger culture in which they are embedded".

Findings of this study on museum educators' perspectives towards learning in museums suggest that educators highlight the educational role of museum. All six educators participating in this study suggest that the museums are educational institutions that want to spread knowledge. In addition, Hein (1998) supports that the museum staff argue that the educational role of the museum is significant. However, it seems that the museum context does not include explicit learning objectives like in the formal education. Hooper-Greenhill (2007) also suggests that, "the educational role of museums remains ambiguous [...] museums have no national curriculum - each museum may present a view of a specific matter" (p.4). Therefore, the focus of museum is to advance knowledge and to get the attention of the children about specific themes or areas of the museum.

Moreover, findings of this study demonstrate that museum educators give various definitions towards learning in museums. Two out of six museum educators (Hanna and Lena) focused on learning in museums as a fun and interesting experience. Falk and Dierking (2013) support that children get more engaged when they are interested about a topic. That means that interest plays a fundamental role in what children take away from the museum experience. However, Dewey (1938) sup-

ported that, “when people are engaged in learning something that interested them [...] the process of learning is enjoyable” (p. 15) but this is not enough to make an activity educational.

In addition, Kate, Fiona and Thea referred to museum as a place that can inspire children. More specifically believes that people learn in different ways (by doing, by acting, by listening, etc.). This is supported by Falk and Dierking (2013) who indicate that each person learns different, “some [...] learn best when they touch things, others from reading” (p.83). This approach can also be related to the educational constructivism that supports that individuals bring their own experiences in constructing new knowledge.

Further, findings of this study illustrated that two out of six educators (Bill and Lena) highlighted the value of the objects displayed as the most important element that distinguishes museums from other environments. Bill, for example, expressed that the objects displayed in the museum is what makes a museum a unique place and separates it from other settings. Lena also said that one of museum's strengths is that it offers experiences with authentic materials and can display three-dimensional objects. This is supported by research that demonstrate that one of the key contributions of museums are that they can offer authentic practical experiences (Braund and Reiss, 2006; Falk and Dierking, 2013).

6.2 The structure of a visit

Findings in this study showed a range of visit patterns, with some similarities. The first main common feature at all the museums were the connections of their themes to the school curriculum. The museum educators designed lessons supplementary to the school curriculum: to encourage teachers and children to use gardening as tool in the curriculum (Hanna), as a service that helps school teachers to achieve the curriculum goals (Bill) and to motivate teachers to come and thus to engage children with the exhibitions which is not possible at school (Kate and Fiona). Allen and Crowley

(2015) suggest that connections with the school curriculum are helping teachers to connect museum activities to school goals and recognise the value of the visit for the students.

The second common feature that findings of this study suggest is the use of the introduction. This introductory talk at the beginning of the visit used by the educators: to address information to the students about what is going to happen next, what they are going to experience, see and do (Hanna, Bill), to introduce their selves and interact with the students in a personal level (Kate, Lena and Thea). During the visits the educators presented their themes and engage students with the exhibitions through dialogue.

The third common feature that findings provided is the absence of follow up lessons. All six museum educators indicated that they do not have follow-up lessons. Hanna demonstrated that this makes it difficult for learning outcomes to be measured but Lena said that this is the way for more classes to visit the museums.

Concerning the evaluation between students, school teachers and museum educators at the end of the visit two out of six educators said that they evaluate their visits (Hanna and Kate). Hanna said that evaluation together with the school classes and the teacher is a way to get feedback and helps improve the lesson. Tal and Steiner (2006) suggest that school teachers' and museum educators' relationship can contribute to students' experiences in museum environments and can support the professional development of the museum educators. They argue that interactions between teachers and museum educators can encourage the active participation of the teachers in the visits and contribute to learning supported both from the classroom and the museum environment.

Falk and Dierking (2013) support the view that, "the way in which a guided visit is organized is the major determinant of its effect" (p.139). Also, DeWitt and Hohenstein (2010) indicate that the degree of the structure of a visit has significant implications for students' learning. Previous research identified that educators can follow a more didactic and authoritarian position (Pringle, 2009; Cox-

Petersen et al.2003). By contrast, the data gathered in this study suggested that educators allowed and supported interactions during the visits while inviting children to ask and answer questions. This study's findings suggest that educators structure their visit in a child-directed way and the lesson can be adjusted to the child's interests. This approach emphasis on constructivist views in museum learning (Hein, 1998) which emphasis on the individual interacting and making meaning with the objects and the phenomena. Hein (1998) also argue that the child-centred approach represents a shift that contrast previous research and has implications for the theory and practices in museum learning.

Findings of this study have shown that educators during the visit were moving around the exhibition together as a group while they were talking about the exhibits. For example, Thea said that she usually explores the museum with the students, walking around to different areas. In addition, both Bill and Kate described a typical visit where they walk around the museum while talking about the objects, the plants or the animals. Cox Petersen et al. (2003) also found that the guided school visit included a typical tour and a description of the exhibits. They also suggest that he tour allowed students to get familiar with the place and explore the exhibits' content. Then the group gathered around the exhibitions where educators were showing them examples of what they have been talking about. Leindhart and Crowley (2002), suggested that examples help to enhance concepts that need to be further explained. Educators' suggested that most of their talk with the children was in front of the exhibits because they want children to look at the exhibits. Allen (2002) that visitor's in museums settings usually they have conversations about the things they are seeing.

In addition, findings in this study suggest that educators could adjust the lesson towards the student's interest about an exhibit or object. For example, Fiona believes that, "educators should listen to the needs of children and make the appropriate adjustments". Thea also argues that, "the introduction should be adjusted to children's needs and mood". This finding is also supported by Allen and Crowley (2014) in a previous study on a school trip to a natural history museum in which the

educators were taking into consideration the needs and the interest of the students. In addition, four educators supported personal connections with the object through questions: "Have you ever seen a fish?" (Bill), "In which room would you have this object in your house?" (Thea). Fiona also said that she engages students to conversation and asks them questions to understand their interests. Le-na also said that she has a conversation with students in the beginning of the visit where she asks them question to figure out their level of pervious knowledge and interests.

Falk and Dierking (2010), have reported that connections between objects and experience help children to become motivated and make their own meaning of the experience. The objects such as paintings, plants, living animals or specimens are used from museum for creating interactive exhibitions and activities (Falk and Dierking, 2013). Findings in this study suggested that educators engaged students on experiences involving direct engagement with the objects. Research depicts the importance of direct engagement with objects as they promote social interactions among peers and teachers while teachers explain or describe the objects (Falk and Dierking, 2013).

Four educators stated that they do not get any feedback and they do not have evaluation from teachers or students. The other two said that they have a recap in the end of the visit where they discuss and reflect with the students (Hanna and Kate). Allen (2002) claims that feedback from visitors is often limited. But, educators argue that when teachers come back to the museum with different groups or with the same group but for a different lesson, this alone is a type of positive feedback. Thea mentions that as educators, they "don't have evaluation between teachers and children [...] but if the teachers were not happy with what they see they would not have come back".

Overall, interviews showed that the visits were based on a dialogue between the students and the educator, the exhibits were stimulating conversation and questions, and examples provided for understanding the content of the lesson. Also, the structure of the visit provided an introductory talk about the content of the lesson and was common at all six museums. Social interactions allowed while students, school teachers and museum educators were moving together as a whole group.

According to the sociocultural theories in which this study is rooted, knowledge is constructed in the interactions among individuals and talk in the form of conversation and questions assists these interactions (Vygotsky, 1978).

6.3 Educators pedagogical practices during the visit

Findings in this study indicated that in some cases, students were working collaboratively in small groups developed by the educator during an activity (Hanna and Lena). This process allows interactions among peers and apply sociocultural theories which enhance interactive situations between students that support learning (Vygotsky, 1978). This is also supported by Tal and Morag (2007) who suggest that students' positive experience during a school visit to museums can be supported by a more student learning approach which includes collaborative tasks. In addition, Cox-Peterson et al. (2003) suggest that when students work collaboratively in small groups, the sociocultural context of the visit is enhancing through the social interactions among students, school teachers and museum educators

This study suggested that questions were asked by educators during the visit to provide the knowledge level, to support further explanations and later thinking. These strategies are supported by previous research that suggest that guiding questions and explanations provide a better understanding (Ash, 2003; Hohenstein and King, 2010). In addition, these findings are contrasting previous research that suggested that museum educators during a museum visit asked closed questions with no intention for children's responses (Cox-Peterson et al., 2003; Tal and Morag, 2007). Bill, is asking questions to enhance scientific understanding during the activity in the 'Touch pool'. Questions are viewed as tool for mediation of knowledge. Vygotsky's (1938) interpretation of the zone of proximal development (*zpd*) emphasises the use of question in making-meaning of a concept. Thea during activity is 'Artefacts' used aiding questions to help children to interpret the object

and say what they think it looks like. In similar approach, Fiona used questions and stories to increase the students' interest.

Ash (2004) has suggested on previous study on conversations of families in museums, that parents used questioning strategies in the form of 'scaffolding' to support learners understanding. Educators, when describing examples of their activities, stated that they use questions to support the child's understanding. Fiona stated that engage students to conversation using questions that suggest further thinking and imagination (What do you think about this? How did people view this at the time it was created?). She also argues that she always answers students' questions about specific content but her focus is to support learner's own meaning. This argument is also supported by Rice and Yenawine (2002) who state that educators' teaching tools should encourage learner's meaning-making skills.

The structure of the activities was flexible and educators wanted children to have fun and enjoy it. The interactions with peers were supporter as well as interaction with specific materials that were provided by the educators. Activities were indoor or outdoor, questions that connected prior knowledge were very often asked to engage children to the activity. In addition, some of the activities involved, experiments and investigation, use of different senses and interpretation of objects through open-ended questions.

The data analysis also suggested that some of the educators used storytelling. Fiona use stories to make children more interested. She said she chose stories that are funny so she can get children more focused. She is using storytelling to address the different meanings of a painting and help children to the make their own meaning. Storytelling is an important tool to enrich students' learning in a more creative and 'memorable' way (Klassen, 2009; Negrete and Lartigue, 2004 as cited in Zhai and Dillon, 2014, p.17). Also, Hein (1998) argues that objects hold 'multiple meanings' and the interpretation of objects is a tool for teaching and learning in museum (p.151).

Furthermore, Falk and Dierking (2013) consider interest to be an important aspect of museum learning and that, “children who are interested in a topic are more likely to become motivated learners about a topic” (p.93). Educators engaged children in dialogue and conversation, often asking them to connect their experiences to prior knowledge and interest.

Findings suggest that educators involved different scenes during activities. Lena said that she includes a lot of material that children can use, touch and explore. She stated that they try to involve different senses in the learning process. Also, Thea has a practical experience that involve different scenes (Lesson: Artefacts), in which children try to figure out an object by using their senses. These findings are in line with what Falk and Dierking (2013) had suggested as “museums experiences need to be enhanced so they better facilitate [...] rich, multi-sensory, participatory venues” (p.250).

The findings in this study indicate that educators communicate knowledge related to exhibit content. Falk and Dierking (1997) found that students during school visits to museums and non-formal environments they could recall three or more things learned on the visit, the majority of which related to exhibit content (as cited on Cox-Peterson et al.,2003). In addition, objects used by the educators to elaborate scientific reasoning and fact-based dialogues (scientific objects). Furthermore, findings in this study suggest that educators engaged the objects and the exhibitions displayed to support students prior experience and knowledge through questions and discussion.

Furthermore, findings suggested that objects offer opportunities for interpretations, discussion and reflections (Thea and Fiona). Research supports that objects engage students in unique experiences (Hein, 1998; Hooper-Greenhill, 2007; Falk and Dierking, 2010). In addition, finding showed that objects were used to advance scientific knowledge (Bill) and supported exhibit content (Fiona, Thea). Research indicated the importance of the object-learning in advancing scientific and specific knowledge (Chatterjee, 2010; DeWitt and Hohenstein, 2010).

6.4 Interactions between museum educators and school teachers

The present findings suggest that the interactions during the visits between teachers and educators are limited. Educators' indicated that teacher during the visit were following the group but they had a more passive role. Tal and Steiner (2006) previous study on teacher's and educators' perspectives during a visit at a museum suggest that a better communication should be established between them which can provide educators with a better and more focused planning on students' needs. Educators expresses a positive attitude to a better communication with teachers. They stated that when teacher contact them, about the details of a lesson or to ask for a specific request they are always willing to give their feedback and help. Specifically, Thea pointed out that she has lessons designed in collaboration with teachers to achieve school specific curriculum goals.

The vast majority of educators suggested that connect their topics and themes with curriculum goals. This is a way to attract more teachers and give the opportunity to students to visit the museums. Some of the educators work together with the teachers to connect the school curriculum goals. Bill, indicated that they invite teachers to make the specific connections with the curriculum because they are more familiar with the curriculum. He also expressed satisfaction as he thinks that working together with the teachers is a more strategic way to develop a lesson. He also added that, "works really well for both". In addition, Thea said that they meet with a teacher reference group people once a month to discuss curriculum connections and the challenges educators' facing during the visit.

6.5 Roles and profession of museum educators

Educators' do not perceive themselves only as knowledge mediators. Findings suggested that they want to have an inspiring role. This is mostly why all educators have indicated that they are passionate about what they are doing, "We are all here because we are really excited about teaching science" (Kate, Science Centre), "This was my dream job" (Lena, Natural History Museum) or "My

passion is outdoor learning” (Hanna, Botanical garden). This is also supported by Pringle’s study previous study on educators’ pedagogical practices (Pringle, 2009) that they define their role as mediators of a creative process. In addition, Tran and King (2007) noted that educators engage their passion for the specific subject (science, outdoor learning, art) into practices that can inspire interest to children.

The current study findings demonstrate that museum educators have diverse backgrounds (biologists, marine biologists, teachers in biology, art historians). Tran and King (2007) have also found that previous studies identified the varied backgrounds of museum educators. Data suggested that educators’ have a variety of responsibility and different tasks. They plan the school visit, design exhibitions and work with different students’ ages and abilities. Tran (2002) found that educators’ interview suggested the complexity of their role. In a similar approach, educators in this study stated that they work with different ages and they have multiple responsibilities in the museums.

In addition, findings suggest that educators perceive their role as specialists of the content knowledge in each museum. The educators expressed that a visit guided by an educator can provide students with deeper level of knowledge in the museum context. Zhai and Dillon (2014) found that during school visits to botanical gardens, teachers prefer guided visits because they believed that educators have a mastery of content knowledge.

The findings in this study suggest that there was not any specific professional training for museum educators. Most the educators working in the museums had a background in science or art. Educators’ stated that there is no specific qualification for museum educator. Bill argued that, “museum educators in the aquarium are qualified biologists, not educators” and Fiona mentioned also that, “everyone working here needs to know about art or to hold a bachelor in art or culture”. Allen and Crowley (2015) also found that educators focus more on their specific content knowledge and less about their pedagogical practices. In addition, Falk and Dierking (2013) supports the view that, “differences between professionals working in museum [...] unquestionably exist” (p.25). Both

Allen and Crowley, (2015) and Tran and King, (2007) suggest that the development of the profession of museum educator should encourage reflection on teaching and learning through conversation and practice in non-formal settings.

In the next section, findings are discussed in relation to their implications for the literature and for the research questions previously introduced.

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CHAPTER SEVEN: CONCLUSION

The aim of this study was to gain a better insight into the roles and the practices used by professional educators during a school visit. This study presented common patterns of the pedagogical practices of museum educators framed by sociocultural (Vygotsky, 1978) and educational constructivist theories (Dewey, 1938; Hein, 1998).

Findings in this study showed that museum educators used pedagogical practices towards sociocultural and educational constructivist theories. Museum educators during the school visits support both practical activities that engage objects displayed in the museum and activities that support interactions among children and educators (such as students working in small groups).

Moreover, the findings of this study demonstrate that museum educators used questions and conversation as tools to identify and determine prior knowledge and interest. However, even though prior knowledge and interest consider to be important factors for enhancing and support student's learning, they do not lead always the visit but educators focus on subject based learning and try to connect the museums' themes to the school curriculum in order to attract teachers and school groups to visit the museum.

In addition, interview data suggest that museum educators stated that the most unique characteristic of museum learning is the objects that are displayed and for that reason they prefer activities that promote active participation with the objects in museums, in different forms such as interpretation, use of different senses and outdoor lessons.

Moreover, museums involve many voices (institutional, educators, disciplines) that create a diverse environment. This diversity makes the museum a complex environment. Findings from the current study suggest that the institutions were supporting their educators' work and learning in general. This demonstrates that institutions have realized that they need to establish a dynamic relationship

with schools and students. Crucial challenges still exist in terms of evaluation and follow-up lessons; such activities need to be developed and discussed further.

Furthermore, findings of this study indicated that educators need to have an educational background relevant with the museum disciplines while a teaching degree was more a complimentary degree and not a compulsory qualification. This invites discussion about the professional preparation and practice of museum educators. Interview data revealed that educators identify themselves as specialists who can provide a deeper understanding. However, both content and pedagogical aspects should be considered during learning in museums. In addition, the interactions between school teachers and teachers showed that museum educators are willing for teachers to get more involved before, during and after (evaluation) the visit, but they appear to expect from teachers to initiate the communication.

In addition, findings of this study indicate that educators perceive a visit to a museum as a positive experience that can enhance learning. Data suggested that these experiences build upon active participation and interactions between students, educators and objects. These findings also showed that educators employ a range of pedagogical practices that reflect on educational constructivist approaches (Dewey 1938; Hein, 1998) and sociocultural theories (Vygotsky, 1978). These practices support both practical activities that engage objects displayed in the museum and activities that support social interactions among the students and the educators.

Museums need to reconsider their practices and goals. The notion of a child centred approach should be employed and embedded in the educational practices used by educators. This study is framed by educational constructivist approaches and sociocultural theories which emphasize on active learning, social interactions and language as means that support learning. Therefore, these strategies could be a starting point for the establishment of a theoretical background for the profession of the educators.

In conclusion, the findings from this study draw attention to the significance of the role of educator and his or her pedagogical practices during a visit. Thus, educators are perceived as an integrated part of the museums. However, museums should “ensure the quality of their education provision” (Tran and King, 2007, p.145) by establishing the professional development of their staff in relation to content knowledge and pedagogical skills.

7.1 RECOMMENDATIONS

Although the museum educators' pedagogical practices towards learning revealed positive attitudes that promote educational constructivist views and sociocultural theories, the development of their profession needs further discussion and research.

Findings from the current study showed that there is no specific training for museum educators.

Tran and King (2007) have suggested that courses or degrees would support the professional value of educators in non-formal settings. A professional training programme of museum educators could consider the museum's focus subject, museum pedagogy and the unique characteristics of each educator. In addition, for the development of their profession and practice, museum educators should have the opportunity to attend lectures from other educators and get involved in further research considering learning in museums. Examples of educational programmes for museum educators should include professional networks and degrees or certificates relevant to museum studies, and should involve pedagogical courses specific to museums as teaching and learning environments

Another suggestion for further discussion could be a professional dialogue between museum educators from different disciplines in order to reflect on practices and new ideas.

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APPENDICES **Appendix 1: Museum Educators**

Hello [Name],

My name is Apostolia Roka and I am an International Master Student in Educational Research at the University of Gothenburg. I am currently writing my thesis in relation to pedagogical moves of museums educators.

I would like to set up an interview with you regarding your pedagogical work at the museum. If you could spare 30 minutes it would be of great help with my study.

For any further information about my study you can contact me or my supervisor Dawn Sanders, xxxxxxx@gu.se

Thank you in advance,

Apostolia Roka

Appendix 2: Interview Guide

Background Information:

1. What is your educational background?
2. Do you have any teacher qualification or experience?

Educational Philosophy:

1. Which is your personal philosophical view about learning?
2. Why visit a museum? Why this museum in specific? Does the museum have any educational role?
3. How do you see the role of museum educator?
4. Why school visits conducted by professional guides?

Structure of a Visit:

1. How is the museum content communicated?

Before the visit: Do you have any planning, any connections with the school curriculum or the teachers

During the visit: Do you use any activities during the visit, if yes what kind? Can you give an example? How do you engage objects during the visit, if you engage them? Do you ask questions, if yes, why? Any other interactions between you and the students?

End of the visit: Do you have evaluation from teachers or students? Do you have any follow-up lessons? Do you have evaluation among colleagues (discussion, reflection)?

Profession:

1. Any specific training for museum educators? Any qualifications?
2. Is there anything that you would like to add?