QATAR UNIVERSITY

COLLEGE OF EDUCATION

INTEGRATING MUSEUM RESOURCES IN FORMAL EDUCATION: A PROPOSED MANUAL FOR GOVERNMENT SCHOOLTEACHERS IN QATAR

BY

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ABSTRACT

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Title: Integrating Museum Resources in Formal Education: A Proposed Manual for Government Schoolteacher in Qatar

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The purpose of the present thesis is to showcase integration of museum resources into government schools' pedagogical practices in Qatar. Museums are significant educational institutions that can upgrade classroom teaching-learning experiences. However, the status quo regarding schools' utilization of museums' offerings is limited. Thus, a manual was designed to support a national interdisciplinary educational partnership by implementing museum-school instructional design. Three research methods were applied to conduct the study: Systematic Review, Documentary Research and Educational Research & Development. The key findings were a set of factors that impact effective museum-school practices, strategies to facilitate schoolteachers' efforts of integrating museum resources into their instruction, as well as a manual guide for teachers and stakeholders' reference about the utilization of museum resources in Qatar. A highlight outcome was a customized integration strategy that was developed based on reported factors and Qatar government schools' mandates.

DEDICATION

To my family, friends, and mentors, whose support and guidance have been the pillars of my academic pursuit.

ACKNOWLEDGMENTS

I express my gratitude to Qatar University and my professors whose teaching have profoundly influenced the trajectory of this thesis. Their knowledge and dedication to education contributed to my academic growth and the completion of this work.

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Chapter 01: Introduction

Integration of museum resources into teaching practices is an instructional design philosophy. It advocates for innovation and excellence in schools teaching-learning practices. At its highest level, this education philosophy would be the outcome of a series of thorough decisions, planning and implementation by different stakeholders. If this should occur, the joint forces between these distinctive cultural and educational organizations have the fundamental ingredients to generate effective and inclusive experiences that are compatible with the requirements of the 21st century. The present thesis is a documentation of an educational discovery to identify and develop practical guidelines about integrating museums into classroom practices in Qatar.

Integration of museums in a classroom is the product of holistic planning and performance of a variety of principles that occur prior, during, and after the lesson period (Morrison et al., 2019). The experiences designed by teachers for students to acquire knowledge are countless. Learners' cognitive development processes involve a significant amount of effort from a teacher that goes beyond standing in front of a board or lecturing for 45 minutes. The preparation for an effective instruction took years of experience from filed experts and countless hours from an instructor's time to generate meaningful learning among students. Therefore, schoolteachers require major educational support for the outcomes to meet the set expectations or have a long-term impact. A promising supporting agent is manifested in the pedagogical practices of museums. The utilization of museum resources by teachers in government school of Qatar can promote comprehensive effective instruction.

Currently, partnership collaborations between museums and government schools in Qatar exist. There are several initiatives between Qatar Museums (QM) and Ministry of Education and Higher Education (MOEHE) that concern utilizing museums' resources. The collaborative programs primarily encompass plans and activities developed by QM targeting school principals, teachers, students and other relevant stakeholders (Alsharq, 2019). However, these partnership initiatives are one-directional, QM offers and schools participate. In addition, they are short-term interactions, which are restricted to limited amount of time and tackled topics. However, the status quo is not immutable, there are opportunities for optimization that surpass the current situation. Schoolteachers of diverse school subjects can benefit from the available resources on a regular basis by incorporating museums' collections, interactive exhibits, digital assets, and experts into their lesson plans. Through effective integration of museum-school partnership, teachers can perform immersive instruction methods that resonate with students on a great level. Well-designed encounters with different QM entities and their variety of resources can stimulate active learning and effective instruction through museum-based education. Yet, the devil is in the details.

Despite the simplicity of the stated idea, the utilization of museum resources is intricate in implementation. The success of the partnership and resources integration depends heavily on the competence of teachers with the proposed instructional design. Teachers should be equipped with relevant knowledge about museums and non-formal learning in cultural organization as the integration requires alternative approaches (Chadwick & Dawson, 2015). There are global published studies conducted on related matters that government school teachers can explore; still, there would always be the

challenge of educational cultural differences. Ideally, teachers in Qatar would need partnership guidelines influenced by the local educational culture, philosophy and ecosystem. Something that is specifically developed for the purpose of effective museum-school partnership, as Ill-equipped schoolteachers would affect the implementation process of the proposed instructional design and the collaboration initiatives perhaps would be less effective. Sorting such challenge would champion museum-based learning practices in Qatar. And in the long run, the partnership could hold the possibility of paving the way for educational transformation and ultimately reform in the nation.

Accordingly, this study is conducted as an effort to explore and generate approaches to overcome challenges and promote museum-school partnerships locally. The stated obstacles and others encountered in literature would be examined towards crafting solutions suitable for a variety of partnership situations. Museums, being non-formal learning settings, offer a platform for innovation and real-world context for formal learning practices. Thus, both organizations' mandates differences should be explored and harnessed. Eventually, by compiling the study's findings, best practices, integration strategies, and partnership guidelines into a single document, this would empower teachers with the knowledge and tools needed to effectively utilize museum resources in classroom settings.

National interdisciplinary partnerships between formal and non-formal learning organizations have massive potentials. The current situation of the collaborative initiatives is the tip of the iceberg for such pedagogical initiatives. To improve optimization, teachers should have the liberty and competence to design their own

instruction experiences for their students depending on museums available resources. However, engaging students with meaningful learning through museums requires comprehensive guidelines for teachers to plan the journey successfully. The following sections of this chapter set the stage for the study by showcasing the problem statement, key questions and objectives, significance, and finally the structure of this thesis.

Research Problem Statement

Qatar is a hybrid nation with a variety of cultural and creative organizations that offer educational programs to school groups. QM entities are among these active destinations which constantly deliver meaningful learning experiences to students and teachers (Alsharq, 2019). However, the offered programs are usually developed and delivered by museum personnel, which causes two main problems. First, teachers become passive participants during the collaborative session(s). Second, teachers' utilization of museum resources would be limited by the entities' offerings. Consequently, constraining both the methods and frequency of integration into classroom instruction. Moreover, another key problem affecting teachers' autonomy is the scarcity of comprehensive resources designed to equip government schoolteachers in Qatar on effectively utilizing museum resources. This study explores possible methods to give teachers the autonomy of integrating museums into their classroom instruction. The involved research includes (1) global museum-school partnership practices, (2) methods for government schoolteachers to use museum resources in their classroom instruction, (3) the main elements that should be included in a reference resource dedicated to utilizing museums. The aim of this thesis is to develop a manual guide about using museum resources for government schoolteachers in Qatar, that is holistic, practical, and customized to suit the national curriculum standards.

Questions of the Study

1. What are the factors and practices of effective instruction in collaboration with museums?
2. What strategy can be used to integrate QM resources into government schools' instruction practices in Qatar considering constructivism philosophy?
3. What are the key components of a user manual to support effective instruction for government schoolteachers in Qatar through the utilization of museums' resources?

Objectives of the Study

- Identify different classroom practices that occur in partnership with museums.
- Provide integration strategy influenced by QM available resources and the national curriculum.
- Develop a manual that guides government schoolteachers in Qatar through effective classroom instruction based on museum-school educational partnership.

Significance of the study

This thesis studies school-museum partnership with the focus on the aspect of instruction. The study promotes the utilization of museums' resources by teachers towards developing innovative, active, and successful instruction within the nation's government schools. Its significance occurs on several levels and towards different sectors which are:

- *Schoolteachers* - The manual and the featured materials serve as a blueprint for the proposed instructional design in Qatar's government schools. The developed

manual provides teachers with essential museum pedagogical knowledge and skills create active and meaningful learning experiences for their students through museums.

- *Qatar Museums* – Cultural institutions like museums are established with education being in the core of their mandate. Their existence and offered services aim to contribute to the development of different groups and organizations within a community. Optimizing the museums' utilization by government schools in Qatar through a variety of channels would support QM in fulfilling its full potential. The study's findings would encourage and drive teachers to reach-out to museums and benefit from the available resources.
- *SDGs and QNV 2030* - The implementation of museum-school partnership would support global and national visions regarding education. The study's proposed manual will guide museums and schools toward practices that influence lifelong learning quality education, and organizations' partnerships, which are demonstrations of SDGs and QNV 2030 aimed outcomes.
- *Academia* - This thesis would enrich and diversify the body of literature regarding museum-school partnership as well as instruction. The lack of studies conducted in Qatar, especially about such educational partnerships, would be supported through the publication of this thesis and the manual. Moreover, it could serve as a foundation for follow-up research and studies. Chapter 05 of this document includes suggested research topics for future studies.

Definitions of Terms

Formal learning: structured learning that takes place within formal institutes such as schools and universitas. This form of learning is intentional by educators and students (Johnson & Majewska, 2022).

Non-formal learning: organized learning that usually occurs outside compulsory educational institutes. It encompasses a wider array of learning activities compared to formal learning (Johnson & Majewska, 2022).

Museum Resources: a supply or support of both tangible and intangible museum assets such as the facilities, collections, programs, and expertise of field professionals.

Proposed Manual: designed document that features suggested structure, content, and guidelines for a document that is being developed to serves as a blueprint to assist practitioner.

Government Schools: formal educational institutions that are established and supported by the government.

Thesis Organization

This thesis is organized into five main chapters which demonstrate a comprehensive view of the study. Chapter 01 provides brief introduction and contextual background of the study. It also includes the research problem statement, questions, objectives, and significance in several key fields. Chapter 02 underscores relevant literature, establishing theoretical framework, recognizing fundamental concepts, and reviewing previous studies. Chapter 03 offers an overview to the study's conducted methodology. The chapter involves research design, data collection methods, and adopted analysis approaches. Chapter 04 showcases the results. It highlights the findings of the study, the analysis of the collected data, and presents the proposed manual. Chapter 05, is dedicated to the interpretation of the results, offering discussions to their implication as well as its contributions to the field. In addition, it exhibits the development and completion process of the manual guide in detail. The Conclusion summarises the main findings of the thesis and its proposed manual. Figure 01 is a visual illustration of the present thesis organization, which also shows the steps followed in the manual making.

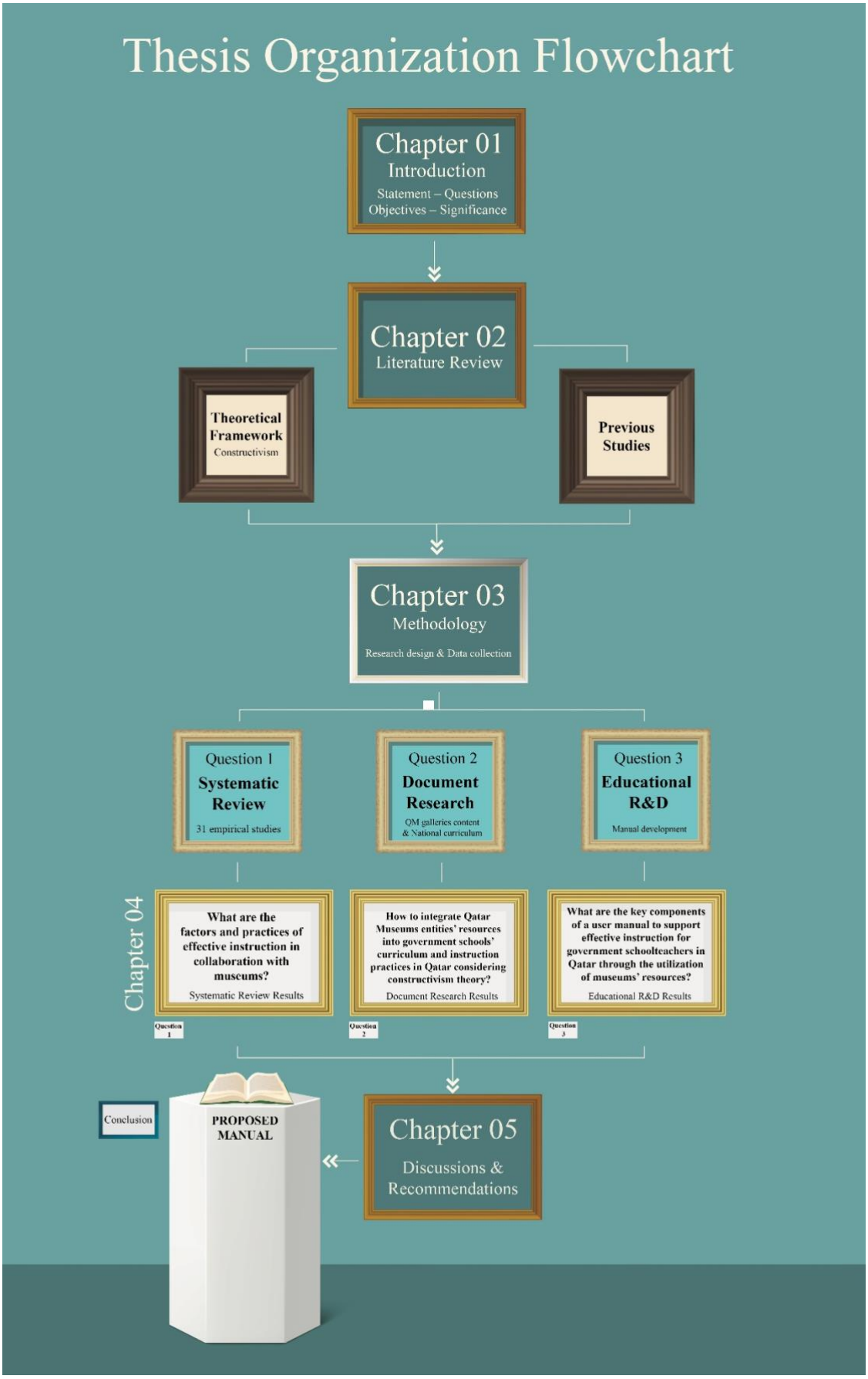

Figure 01. Visual representation of the thesis organization.

Chapter 02: Literature Review

This chapter exemplifies a collaborative work between psychologists, academics, and researchers where their different views on learning frame this study. Learning is a notion that has been studied, interpreted, and contextualized by different professionals to better understand the processes of its occurrence and development. This study is grounded on constructivism learning theory towards crafting a scientific and practical educational guide for teachers. The chapter is divided into three main sections where each showcases a unique aspect concerns teachers use of museums in teaching. The first section is dedicated to learning theories and concepts which support meaningful and active learning. The second section explores the notion of museums education internationally and locally. The third section focuses on previous studies that were conducted with aims related to similar educational collaborations.

Theoretical framework

Constructivism is a phenomenon theory that views learning as cognitive development rather than behavioural responses. It is a mighty psychological theory that found its way to the education field, influenced classrooms practices for decades and imprinted museology perhaps for ever. The theory suggests that learning is built, or constructed, on previous knowledge. That the existed experiences and knowledge are not completed or isolated, rather they are alive and grow with new interactions and occurrences (Fosnot, 2005).

Constructivism emerged through psychologists as a movement of contradiction to preceding theories that neglected the mind (cognitive) and sensed learning through visible actions (Fosnot, 2005). The foundation of the theory is attributed to the work of the psychologist Jean Piaget who is known for conducting

studies related to children's cognitive development (Fosnot, 2005; Liu & Chen, 2010). Furthermore, another psychologist that his name is associated with constructivism is Lev Vygotsky's who complements the stated notion of constructivism with a social dimension. He argued that learning is developed based on the social interaction with the surrounding community (Fosnot, 2005; Liu & Chen, 2010). Social constructivism theory continuous to be one of the key practiced branches of constructivism with contemporary studies conducted around its principles. Nonetheless, Vygotsky gifted the world with yet another significant learning concept which is Zone of Proximal Development (ZPD). The concept of ZPD is significant especially for constructivist teachers to understand their position in relation to students' learning. ZPD as explained by Vygotsky is the distance between what someone can perform independently and the level of when guidance should be provided (McLeod, 1970). Rephrasing the two lines into a classroom context, it is the knowledge of a student and the push needed towards reaching an advanced or higher level. That act of push is performed by a more knowledgeable person, a teacher or even a peer student, and the action itself is called scaffolding (Nyikos & Hashimoto, 1997). This interpretation highlights the concept's roots in social practices as it promotes for interaction with others for learning to be upgraded. Real-life examples that demonstrate constructivist teaching practices through utilization of museum resources are explored in the Previous Studies section.

Constructivism in Practice

The principles of constructing knowledge through social interactions are integrated in both education cultures, schools and museums. Accordingly, constructivism is associated with learning regardless of the environment being formal

or non-formal. The theory principles do influence teaching methods in classrooms as well as curatorial decisions in establishing museums. The following text elaborates on this concept.

In terms of pedagogy, the theory values can be seen in teachers' methodology of running the classroom or dealing with the students. teachers who embrace constructivism reject the traditional role of lecturing or creating replicas of their own understanding within the students (Fosnot, 2005). They are merely facilitators and students are the knowledge constructors. Such teaching philosophy work with methods such as hands-on, teamwork, experimentation, and explorations as they allow students to acquire new knowledge on their own basis (Kumar Shah, 2019). Theories like constructivism opposed factory model classrooms, which include teaching-learning styles that were developed to create factory workers rather than unique groups of individuals (Marshall, 1990). Furthermore, according to the mentioned theorists, to have a successful constructivist classroom, students are expected to interact with the real world as an aspect of effective teaching-learning. Consequently, schools can achieve this goal through visits to informal educational institutes such as museums.

These institutions also have their share with constructivism. In terms of museology, this learning theory occurs with some unique and other similar implementations to school practices. Inside a museum, learning happens while walking through exhibits and between showcases. It occurs the moment a visitor starts making meaning by constructing on existed knowledge. This is a core standard in museum making, the theory principles can be found in the arrangement and interpretation of the collection in the galleries (Macdonald, 2013). Furthermore, the development of learning experiences by museum educators is perhaps similar to a

great extent to a teacher's role in a school, thus, same practices as in classrooms happen in a museum premises.

Constructivism Challenges in Practice

This theory, with all its explored virtues, comes with challenges. In creative classroom practices such as constructivist classrooms an often-expressed concern is about the performed methods being unsuited to standardized tests. However, this form of evaluation can be replaced by alternative assessment. In literature, this kind of assessment is addressed under various names such as authentic assessment and performance-based assessment. In such measuring and evaluation process a student is expected to perform towards generating an answer or skill instead of choosing from provided information (Herman et al., 1992). In addition, the assessment and evaluation data are conducted upon activities derived from real life events and executed by students through applying critical thinking and problem solving. There are several strategies that fall under alternative assessment and evaluation umbrella such as communication, reflection and performance-based assessment.

Starting with communication, it is a collaborative assessment between a teacher and student. The involved parties contribute towards evaluating the learner's progress and achievements. Moving to reflection, it is a student generated assessment strategy. Learners are responsible for measuring their own performances and indicating any progress or shortage. Lastly, performance-based assessment which is self-explanatory; it's where students have to perform certain tasks that reflect their acquired skills and knowledge. Adopting this form of assessment gives teachers a sense of their students understanding and implementation of a topic within its context. Furthermore, the next part includes some techniques and tools used in performance-

based assessment. Throughout the research, it has been noticed that there is a blurred line between assessment strategies and tools. For instance, portfolio was mentioned under techniques and strategies while some resources listed it under tools. The classification could depend on the assessment function and the teacher's decision. Portfolios are believed to be one of the most popular techniques in authentic assessment. It includes a variety of a student's work over a period of time such as writing materials, artworks, etc. They provide a sense of growth and achievements of a learner. What's special about this form of assessment is that the featured content is developed and selected by the students (Kerka, 1995). In teaching history, among the examples of activities that could complement alternative assessment would be drawing cartoons, writing customized newspaper, and simulations of historical events (Drake & McBride, 1997). These activities can be part of a portfolio and by the end of a given period a teacher could evaluate the product of the student. Further elaboration on activities is stated in the next paragraphs.

An approach that could be placed under portfolio is timeline. For example, a history teacher replaced a major essay writing, which usually takes place towards the end of a semester, with a creative approach which is a timeline. Students had to create a small part of the timeline by the end of each session. This gave the teacher a chance to see students' progress throughout the instruction period and at the same time the final product was a tool of assessment. In addition, the timeline approach fostered students' realization of the concept of chronological order of events. (Hawkey et al., 2015). Moreover, multimedia presentation is another suggested activity. It is a form of oral and visual demonstration of a topic or an idea. Additionally, it is a form of communication and performance that a student conduct and present to the teacher, classmates and others. In multimedia presentation a student uses several types of

intelligence to upgrade the performance. In most cases a presentation is used to assess a student's knowledge of a content and less to do with the way of thinking (Edmunds, 2006). Another activity that could be used as alternative assessment tool is learning logs. They are records of students' reflection on a content, teaching method, or personal progress. It is stated that a student's thoughts and reflection are essential to understand his/her perception and comprehension of a content, for instant, historical (Drake & McBride, 1997).

The discussed strategists can be evaluated using criteria or tools such as rubric and checklists. Rubric, is a common scoring guide to evaluate learners' achievements. They provide teachers and students an overview of an assessment. A classic rubric has three fundamental features which are quality standard, rating scale and performance level (Kerka, 1995). Nonetheless, despite the success of alternative assessment not all teachers are capable to perform diverse ways of evaluation. Applying alternative assessment by untrained teacher would jeopardy the learning journey for the students. However, in some education cultures standardized tests are underpinned by organizational polices and cannot be replaced.

To craft an educational manual, it is significant to understand the meaning of learning and its occurrences. Constructivism theory practices depend on the learner's ability and previous experiences in making meaning. In some cases, a support is needed, and it is provided to a degree that still preserves the liberty and ownership of one's learning. This is applied in both formal and non-formal education institutions. Nonetheless, challenges occur due to certain limitations, but opportunities are much bigger to be overlooked.

Effective Instruction

Teachers work go beyond students teaching within a classroom, believing otherwise would be misconception. This understanding can be grasped when typing the word 'teacher' in a search engine. Most of the result images either show an adult in front of a board, or lecturing a group of students in a classroom. Although this is not half wrong, it is still a fraction of what teachers perform. Teachers do have behind-the-scene intensive efforts for instruction to be profoundly effective. They have responsibilities to be taken into consideration to accomplish effective instruction and creating successful learning experiences.

Effective instruction is a blanket term for practices that take place inside and outside a classroom such as teaching, lesson planning, class management, strategies and more. These practices affect students' learning as well as teachers' profession (Muijs & Reynolds, 2018). Among the characteristics of effective instruction is promoting active learning. This concept is a principle and embedded in constructivism theory. It is linked to teaching methods where students take part of the learning process rather than being passive learners. It occurs when the classroom is directed through interactions with peers, discussions with a teacher, exploring topics online and other learning activities (Brame, 2016). These teaching-learning practices as well as outside the class session responsibilities are significant in having successful museum resources integrations.

Museum Education

Museums were conceived as educational institutions since antiquity. The word museum has several meanings; However, in classical Greece and Rome the word had a joint interpretation which is a place for gathering and conducting philosophical discussions (Lewis, 2012). It is with no doubt that philosophy was embraced by

ancient Western civilizations, and it provided the world of academia with two of its master thinkers, Plato and Aristotle. These philosophers' ideas and practices perhaps are immortal for still being respected in contemporary teaching-learning methodologies. An example is the Greek philosopher Aristotle who collected historical objects to use them as a method of teaching in Athens (Lewis, 2012). Object-based learning is a core concept in museum education that proved its effectiveness in learning. Going back to the notion of collecting, it continued in later centuries by different cultures and for different reasons. These private collections transformed into the idea of modern public museums during the eighteenth and nineteenth centuries (Bennett, 1995). Finally, despite learning being part of the system from the beginning, it was not until the twentieth century that the notion of education was introduced as a professional museum practice.

Museum Education: Modern and Contemporary Practices

Museums are educational institutions for casual and intentional visits. In the second half of the 20th century, and precisely after the second World War, education became a prominent pillar for museums, consequently, its role in the community began to stray away from exclusivity and heading towards inclusivity.

Museum education is multidisciplinary field of knowledge. It can be found for example in the interpretation of a gallery's narrative, language of the objects' labels, and the design philosophy of the offered programs. The latter type is perhaps the closest museum education aspect to classroom practices. It is when museum personnel develop learning experiences that complements the galleries content. These experiences can be hands-on, workshops, or simple worksheets. These methods when utilized correctly by teachers can encourage effective teaching (Shi Qi, 2024).

Museums and schools have a long history of learning together. At first this relationship was highlighted by field trips and guided tours; however, in the 21st century this bond grew deeper that now many schools worldwide consider museums for formal education support (Alexander et al., 2017). Museums have valuable objects and continuously create programs influenced by them for learning to be within context. Studies have been published about the effectiveness of museum-school partnerships, objects-based learning, shifting learning environment. There are practices that are tailored to a single visit, multiple visits, or no visit to the physical museum space.

Furthermore, it is believed that museums create an environment of active learning that allow students to gain knowledge while paying attention to their interests and not limited to cognitive traditions (Hohenstein and Moussouri, 2018). In museums, students are given a variety of choices to interact with the exhibits through activities such as engaging discussions, handling collection, and/or creative workshops (Alexander et al., 2017). The active learning approach, access to real objects and support from the field educators are perhaps the elements which make students learning and museums-schools relationship effective and enjoyable. Some nations understood the school-museum partnership capabilities, consequently movements related to this form of teaching-learning occurred.

In 2010, several states in America embraced Common Core Standard Initiative that standardized academic expectations of students in the fields of English and Math. That non-formal education systems such as museums reacted by offering a hand to schools through a series of collaborations and supporting materials (Ng-He, 2015). Schoolteachers and museum educators developed and designed learning practices for lessons to be executed in schools, museums and other educational/cultural spaces.

Merging the two distinctive fields of education together resulted in active learning with good reported results which are influenced by creative teaching through partnership. In addition, empirical studies about school-museum collaborations can be found that enriched the literature due to the initiative.

Another international example that is often referred to happened in the UK. England took a national movement towards shifting schools' attention to museums due to the significance of such educational collaboration. Government schools and museums worked together in fostering teaching and learning practices. Starting 1999, the British educational policy promoted museum-school partnerships on a national level. Hundreds of thousands of students were involved in the initiative with more than 65 museum educational projects. Among the initiative's objectives were strengthening museums and schools' relations, developing a sustained museum educational role, and enhancing students' learning by interaction with original objects. The results of the national initiative research were promising in areas such as museums' educational programme, advanced curriculum development, teachers instruction styles and students' learning (Hooper-Greenhill, 2004). Both presented examples are of nations that embraced museums' significance to teaching. Nonetheless, smaller scale successful initiatives can also be found globally that focuses on specific museums, schools, or subjects.

Museums are extraordinary learning environments with practices that go beyond gallery walls. They could happen inside schools or different relevant venues. The variety of partnerships locations impacts the variety of collaborative educational practices. What were once shrines for the elite are now available for schoolteachers and their students to benefit from. There are countless practices that teachers around the world can rely on museums to provide them with and Qatar is no exception.

Museum Education in Qatar

Museums' industry is relatively new to the nation. Internationally, the practice started centuries ago, while the first museum in Qatar, the national museum, opened its door in 1975 (Alkhulaifi, 2000). The old national museum was renovated and expanded to become the nation's landmark National Museum of Qatar (NMoQ). This educational organization falls under the umbrella of QM.

QM is a parent organization that promotes art and culture. This institution encloses a number of the nations' leading museums and art projects such as Museum of Islamic Art (MIA), Mathaf: Arab Museum of Modern Art (Mathaf), NMoQ, 3-2-1 Qatar Olympic & Sports Museum (QOSM), Fire Station: Artist in Residence, M7, Liwan Design Studios and Labs, Al Najadh, Taswer and more. In addition, QM includes historical sites, public art and gallery spaces. QM and its entities offer learning experiences and programs for a variety of audiences where school students are not exceptions.

Museums in Qatar are of high standards that can be seen through the entities' exhibitions, objects on display and labels. Furthermore, in terms of museum education, QM entities show great emphasis on their educational roles to include online materials, guided tours, hands-on activities, school workshops and outreach programs. These activities are developed and delivered by museum staff such as museum educators to support students in their learning journey. Learners are given various opportunities to engage with QM entities through on- and off-site visits, in addition to interacting with resources featured in the digital platforms. These museums and historical sites contain collections or themselves are considered primary resources for learning. Accordingly, learning with and through QM is a good resource for teachers aiming to achieve effective teaching and learning within context. Qatar is

home to a great number of museums that reflect different themes which public schools can benefit from.

Initiatives under the name of Academic Committee and Teachers Council were established between Qatar Museums and the different school curriculums in Qatar. The goal of these initiatives is to bridge the gap between the two sectors (The Peninsula, 2021). Moreover, a publication was created in collaboration between UCL Qatar and NMoQ about the methodologies and tools of creating meaningful experiences through QM entities titled Creating Learning Experiences in Museums: Discussing – Inquiring – Participating (2020). It featured tips on creating learning experiences the involved for example, discussions, exploration and art making through museum visits. This is a valuable source for two main reasons, first there is a lack of publications with regard to museums in Qatar and second it addresses educators in general who wish to benefit from museums as places for learning. However, government schoolteachers are required to practice teaching by following the guidelines illustrated by MOEHE. Thus, there is a need for information and strategies that is tailored around their education ecosystem to perform effective teaching.

Formal Education and Government Schools in Qatar

Nations' governments establish schools as a response to the community needs and aspirations. These educational systems are reflection to a nation's philosophical, cultural, and economic wealth. The birth of formal education in the country was in 1952 after the discovery of oil and witnessing its massive impact. At that stage, educational experiences, and materials from Arab courtiers such as Egypt and Lebanon were adopted as a foundation of the newly developed field (Alabduallah, 1998). However, the teaching practices majorly revolved around memorization, that

in the 1950s students' pass to a higher division depended on their ability of Quran memorization (Almulla, 2017). Throughout the history of education in Qatar, there system went through a series of reformations.

In 1990, four decades from establishing formal education system in the country, United Nations of Education, Scientific and Cultural Organization (UNESCO) published a report about the quality of education in Qatar. The document stated the need for enhancements in certain areas in the Qatari educational system and among those was teachers' improvement. The report's featured suggestions influenced an educational reform in the country (Brewer et al., 2007). However, decades later research was conducted about education and one of the reported challenges was memorization as a learning approach for students (Augustine et al., 2007). "Education for a New Era" was the slogan of the initiative that launched in 2004 for better teaching-learning practices in Qatar's government schools (MoFA, n.d.). The education mandate and major decisions related to teaching and learning in Qatar falls under the responsibility of MOEHE.

MOEHE is the country's education guardian and QNV 2030 supporter. Its vision and values demand for innovation and excellence to be illustrated in the nation's education scene. The ministry oversees several education organizations and government schools are an example. Qatar has 203 government schools spread around the peninsula, serving over 190,000 learners (MOEHE, n.d.). The school curriculum is set by the Ministry of Education for K-12 students; however, in terms of evaluation, it is divided into three general sections: Grades 1 – 3, the assessment is decided by the instructor; Grades 4 – 11, follow the National Assessment Policy; Grade 12 students are required to pass high school examination (MOEHE, n.d.). As any education system students' evaluation is needed towards having evidence of their competence

and for the ministry to assess the education level towards meeting QNV 2030 standards. Moreover, teachers as well form a target group which the ministry pays attention towards; that teachers' professional development became a key principle in the ministry's policy and values. Their development would heavily impact the quality of teaching-learning which is what the ministry and the nation aspires to have.

Government schools, teachers and students had a long journey to reach the current level. The country's oil wealth and later the conducted research helped in establishing and enhancing the education scene in Qatar. This uneven and positive journey brings confidence that museum-school partnership can be implemented in Qatar to support government schools in achieving the nation's goals.

Museum-School Partnerships

A teacher's consideration of museums for teaching-learning purposes has an escalating trajectory. This educational partnership goes back to the 20th century, precisely in America, when teachers started taking their students to museums as part of field trips (Ramsey, 2016). Museum education is relatively new, at least when considering the ancient history of museology field. Up until last century, such places were exclusive to certain groups within a community such as the elite. However, the contemporary commitment of museums goes to life-long learning and inclusivity which perhaps motivated and encouraged school personnel to visit the institutions with their students as a form of teaching-learning experience.

It comes with no surprise that teachers would consider museums as an educational destination outside the school environment. One of the powerful aspects about museum education relies on the availability of primary resources and placing original objects within context. Object based learning is heavily practiced inside museums as it holds the ability to boost active engagement within students physically

and intellectually. In other words, progressive education movement philosophy is profoundly embedded in museum education where in a museum-scenario a student learns from and with objects (Macdonald, 2013). School-museum partnership is an approach that teachers and schools in general should adopt when attempting to get external educational support and creative learning experiences (Ponce-Delgado et al., 2024).

Educational partnership occurs as a result of two or more parties from formal and/or non-formal organizations collaborating towards achieving mutual goals related to students' learning enhancement (Cox-Petersen, 2011). In this study the two educational groups are museums and government schools where the two fields have decades of partnerships history. Museums are defined as cultural, educational, and scientific canters with a touch of entertainment that contributes to the development of the society (ICOM, n.d.). These notions are well-suited to schools' objectives which therefore influenced the robust relation.

Museum-School Partnerships: Effective Instruction

School-museum partnership is the art of merging two distinctive educational cultures towards creating a meaningful learning experience. This joint project was once limited to guided tours throughout museums' galleries and exhibitions. However, modern day museum visits go beyond a guided tour. A visit can include a variety of learning styles and activities that are considered great curriculum support. Moreover, museums in turn do visit schools and bring objects form their collections and field experts to be part of a lesson plan (Moffat & Woollard, 2004). These are effective teaching practices that teacher utilize and learning experiences that museums regardless of their themes can support schools with. Furthermore, the field of

psychology has provided theories, in particular constructivism learning theory, that supports active learning and its impact on students' cognitive development. It is fair to say that the theory learning principles are imitated in this partnership practices.

This instruction learning method could happen at different complexity levels. It can be found on a micro level at a classroom, such as when a teacher uses a worksheet uploaded by a museum educator on the institution's website as a lesson activity. In contrast, it can be seen on a national scale. For instance, in the US, museums reacted to the "Common Core Standard Initiative" through profound partnerships with schools. The collaboration included museum visits, school visits, workshops, online materials and more with the aim of supporting teachers and students in excelling the national standards (Ng-He, 2015). The presented examples are at the ultimate ends of a spectrum. There are a variety of practices in between and more to be developed. As long as schools and museums coexist in a community, partnership could happen. Qatar is home to many thematic museums that schools can easily benefit from their resources and embrace teaching through the lens of museum practices. Government schoolteachers have a gold mine to be extracted and used. The effectiveness and enjoyment of the joint practices do have a future in Qatar specially since it is supported by the country's authority. Nevertheless, the implementation of effective instruction through museum-school partnerships by teachers would also have global and national impacts.

Museum-School Partnerships: Achieving Global Goals

Two of the 17 Sustainable Development Goals (SDGs) can be achieved through the advocated instructional design. These goals were developed by the United Nations towards ensuring prosperous future (United Nations, 2015). The relevant

goals are as follows:

Goal 4: Quality Education - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.

In the context of the present thesis, government schoolteachers and students in Qatar have the right to obtain quality education and lifelong learning chances regardless of the circumstances. For teachers, the existence of a user manual, which is developed based on an intensive study, can be a resource that fosters their continuous learning and knowledge enhancement. In addition, it contributes to their ongoing professional development, which in turn would reflect positively on their students' academic progress. For learners, educational partnership ensures that they have access to meaningful and active learning opportunities in collaboration with museums. Besides, such collaborations guarantee students are equipped with necessary skills to utilize museum resources. This would empower students to engage in lifelong learning as they would be familiar with museums and their limitless learning opportunities throughout their lives.

Goal 17: Partnerships for the Goals – Strengthen the means of implementation and revitalize the global partnership for sustainable development.

The current thesis focuses on the notion of partnerships to foster effective instruction practices. Having relationships between QM and MOEHE on a level as well as between schools and museums on another level are essential for coordinating linked efforts and resources. In addition, the partnerships encourage knowledge sharing among relevant parties which is an investment in educational programming that enhances skills and expertise in museum-based learning.

Museum-School Partnerships: A Patriotic Obligation

Educational partnerships between formal and non-formal learning systems in Qatar do have a patriotic obligation to fulfill. Education institutions, each with its unique learning ecosystem, are responsible to promote and support the growth of young learners in the country. This national duty is stated clearly in Qatar National Vision 2030 (QNV 2030) under Human Development Outcomes as follows:

A national network of formal and non-formal educational programs that equip Qatari children and youth with the skills and motivation to contribute to society, fostering:

- *A solid grounding in Qatari moral and ethical values, traditions and cultural heritage*
- *A strong sense of belonging and citizenship*
- *Innovation and creativity*
- *Participation in a wide variety of cultural and sports activities*

The concepts of heritage, citizenship, innovation and participation stated in QNV 2030 can be accomplished at different levels through school-museum partnerships. The number and variety of museum themes in Qatar have the capability to collaborate effectively with formal education, consequently, foster young learners' experiences. Moreover, when instruction and teaching are performed using museums' resources inside classrooms, this ensures that every student will have the opportunity to experience non-formal education programs. However, the diversity of museums and ambition to support a national education movement is a double-edged sword. They are well-suited factors for the development of the education in Qatar, yet they can be misapplied especially with the lack of channels and/or materials that direct such initiatives. After everything, like many collaborations, with careful planning the project can succeed.

Manual [ˈmæn.ju.əl]

noun

A book that gives you practical instructions on how to do something or how to use something, such as a machine (Cambridge University Press, n.d.).

The word ‘manual’ definition as explained by Cambridge Dictionary is presented above. Interpreting the description in the study’s context would be, a book for teachers that provide guidelines on how to utilize museum resources for effective instruction. People used manual since old times. They were developed to standardise and transmit knowledge while underlining the know-how techniques for end-users (Greager et al., 2020). There are several other ways for the findings to be shared with teachers as practitioners such as trainings, workshops, courses, etc. however, this form has several advantages which are well-suited to this thesis.

Manuals have the ability to spread widely, save time and are familiar. In manuals history, these texts travelled the world and transmitted knowledge to practitioners across the continents (Greager et al., 2020). In addition, it has a distinctive feature which is familiarity to the user. Manuals are among the world practices that are common knowledge. Perhaps most people had occurrences in their lives that using a manual or how-to instructions was the only needed support. For example, it could be using a new device, conducting a study using a less familiar methodology, or performing a task in a requested manner. In all of the mentioned cases, manuals are usually used to instruct and guide practitioners about the new product/knowledge.

The production of teachers’ manuals is still practiced. They are updated and follow modern trends. They are available online covering different topics with

different professional levels. However, manuals such as in the computer production industry are losing their value due to reasons such as cost and the availability of alternatives such as search engines results and videos (Pogue, 2017). In both cases, online is the chosen platform. The development and distribution of a manual guide is a necessity for teachers' support and the project's success. Due to the novelty of school-museum collaboration in Qatar, the concepts' implementers would need explanations and instructions compiled into a single source for smooth and successful performance. Despite for instruction and teaching being a regularity for centuries, teachers need to be supported in this changing world. Leading education organizations and associations still develop instructional texts in the form of manuals for teachers to enhance classroom practices. The motive behind these publications differs, they could be in response to a crisis, integrating a new technology or recent findings about learning. Based on that, it is our responsibility as museum personnel to curate museum educational resources and give a hand to teachers during their teaching journey. Moreover, partnerships as stated is the preceding paragraphs requires all parties to be actively involved. Offering the museum collection and galleries space is part of the deal; however, it is static. The manual is a way of communication between museum educators and their partners in the formal education system. In summary, developing a manual is a typical practice when support and success are desired.

Previous Studies

The concept of using museums and its resources have its share of literature and studies. In this section, the thesis's main discussed topics are explored through studies conducted for different purposes and covers a range of utilization styles.

Museums On-site Programs

Non-formal institutions like museums do not rely completely on the exhibited works. There are programs being offered which complements the visit. These programs vary in their styles and complexity. In addition, sometimes an on-site program is developed by a schoolteacher to support museum learning of their students.

Fazzi and Lasagabaster (2020) conducted a study that showcased implementation of the effective Content and Language Integrated Learning (CLIL) method; however, their research's input was to test CLIL technique in non-classroom environment, particularly inside a museum premises. The study's sample was 284 students from secondary schools in Italy. The experiment took place in the Natural History Museum in Venice where the students visited as part of the study. Moreover, during the field trip Students' engagement with primary resources, utilization of a learned language in a non-school environment and students' interest were among the researchers focus. In the visit, students used English language to communicate with the museum staff as well as to solve an assignment about animals' classifications. To collect data for the study, researchers applied mixed methods of quantitative and qualitative tools, questionnaires and focus group respectively. The main finding was that students were able to practice their English language outside the classroom which created positive responses towards learning through museums.

Moreover, Charitonos (2019) studied using mobile phones by students during a museum visit based on the tenets of mobile pedagogy. The aim of the study was to showcase the significance of linking between practices that take place inside the classroom and outside the school. The study sample was year 9 students that were instructed to use Twitter as a form of microblogging. That data collecting method was

through interviews and observation. The results were that innovation in education is not restricted to a device; however, it is mainly the pedagogical quality of the program as well as combine between the traditional and new technology.

Furthermore, Nyamupangedengu and Lelliott (2012) investigated the effectiveness of using worksheets during a museum visit. The study included grade 4 – 7 students. The result showed that worksheets do support students learning. The data collection method was audio recording to students' conversations throughout the visit as well as observations. The results suggested that having worksheets during a museum visits services as a guide, keep the learners focused, engage students with the collection and the staff, and encourages students to collaborate in finding the answers.

The first example shows that museums can be used in creative ways not just through collection exploration but also collaborating with the staff to deliver the program in a desired language that suits the purpose of the visit. The elements that enhance the traditional guided tours could either be using electronic devices or papers. They both keep students focused and engaged. The decision depends on the availability of the tools and purpose of the assignment. For example, if a lesson objective is to enhance handwriting as a skill, then worksheet is a choice to consider. However, if it's more linked with sharing knowledge integrating new technologies, then perhaps tablets or mobile phones devices fit better. Nonetheless, one of the examples was a traditional guided tour. Students visited the museum only with guidance from a staff, which is considered suitable since enhancing the language and using it outside a classroom was the motive.

Museums Off-site Programs

Museums do offer their collections and learning materials to be utilized outside the museum walls in other venues. In addition, often museums send staff to other organizations to facilitate a museum related program as an extended version of the museum. In general, these programs are part of museums outreach projects.

Badger and Harker (2015) study focused on travelling exhibitions and the effectiveness of the museum service on students intellectual-wise. The study sample was middle school students who visited an off-site museum program as a learning experience. Different kinds of data were collected for the study through the following methods: interviews, surveys, and observations. Nonetheless, the results showed that such museum initiatives are recommended due to their ability to engage students in terms of education. However, one of the researchers' comments was that museums should provide teachers with guidelines to the exhibit the same as they do in the original museum.

Badger and Harker (2015) conducted another study on the same travelling exhibition. However, the study highlighted the effect of museums off-site initiatives on teachers and students with low-income and schools in rural areas. The study's sample were teachers and students from five middle schools. The data collection method was from interviews, surveys and students' thoughts that were illustrated in the writing wall activity. The findings were that students had an opportunity to link school curriculum with real world experiences. In addition, the travelling exhibition gave teachers a tool to see their students from a different angle that the classroom.

These two examples investigated the impact of off-site museum activities such as travelling exhibitions on schools. Despite being the same exhibition used in the two studies, the difference of study sample and results suggest that museum resources are

transformative and are perceived based on the eye of the beholder. In addition, such programs are educational and at the same time promote equity by providing access of non-formal education to schools and students from different geographical locations and backgrounds. However, the quality of such programs must be close to the original museum towards providing inclusive experience.

Museums Online Resources

Distance learning and online learning are well-known approaches in formal education especially since they were highly popular during the peak of COVID-19 pandemic. This form of teaching is an option when where the instructor or the program facilitator and students are in different places during the implementation of the educational experience. Moreover, in museum education online learning also applies to the resources and offers museum personnel make available via digital platforms.

Lewis (2020) suggested a list of activities that could be considered by museums as part of their distance education programmes. In the study, the researcher explored the notion of museum distance education as a program to support educators in rural areas. The findings were based on interviews with 14 individuals came from different educational backgrounds. Seven of the interviewees were educators in school located in rural areas. The rest of the interviews were conducted with staff from different museums and a museum consultant. The result of the study was a list of recommended online education activities that museums could offer to support teachers and students.

A more focused study about using museum online resources would be the one conducted by Harrell and Kotecki (2015). The researchers developed a design model

that was called flipped museum. The instructional design was influenced by the known teaching method, flipped classroom. The sample for this innovated technique was High school students were the study sample. The data collection method was mixed between quantitative and. After model testing, the result showed elevation in students learning and promoted effective museum experience. In addition, the flipped museum supported individualized learning, thus, students learn about the museum before the visit, thus, during the field trip they could learn on their own basis and interests. Moreover, a recommendation was that museums should support teachers with pre-visit and after-visit materials that go beyond lesson plans.

Moreover, Flemming and others (2020) conducted a study about the utilization of museums' digitized collection. These materials are considered primary resources that classrooms use as a teaching-learning method. The study sample was k-12 students that used the mentioned online resource of three different museums. The results showed that this museum service is beneficial for both teachers and students. They can be accessed regardless of time and space. In addition, the Flemming and the others recommended that teachers, museum educators and researchers should collaborate to create effective educational programs.

These previous studies focused on digital platforms and online materials which teachers can use in collaboration with museums. The three studies show effective practices that museums and schools alike can develop and utilize as educational approaches. At the same time, the featured activities are unique in terms of the nature of the resources as well as how and when to be implemented.

Exploring previous studies provided significant insights that influenced the fundamentals of this study. They have provided information about the kinds of research that do exist on the topic of school-museum partnerships, which helped in the development of the research objectives. Additionally, these studies supported the research content by showing a wide variety of schools' teaching-learning experiences that take place in collaboration with museums. Moreover, the previous studies provided perspectives that should not be overlooked; for instance, museums are required to offer schools different kinds of programs targeting different learning levels for teachers to utilize. Overall, these previous studies enriched the scope of knowledge of this research.

Chapter 02 showcased the scope and context of the presented thesis. The explored literature provided a framework for the study. The viewed constructivism theory and its tenets were discussed in terms of being a guide for practices in classrooms and museums alike. Moreover, educational partnership suits the education system in Qatar, the availability of museums and values of the MOEHE indicate that innovate teaching is encouraged. Furthermore, the discussed topics and explored studies created a solid foundation to start the data collection phase and find answers to the research questions. Constructivism theory, effective teaching, education partnerships and a manual guide are the essential parts that frames this thesis, and the previous studies helped in painting the picture.

Chapter 03: Methodology

This chapter introduces the mixed-methods research methodology that was adopted in developing the present thesis. The selected methodology was a combination of different research strategies, which together reinforced the paper's aims, questions, and objectives. As stated in the preceding chapters, the purpose of this study was to develop a practical instruction manual for government schoolteachers to support them in their endeavours of museum resources integration in teaching practices. Thus, the exploration of a variety of distinctive relevant aspects was among the foremost steps towards this purpose fulfilment. Implementing different methods was necessary as each research question required special technique(s) to generate deliberate answers. Systematic Review, Documentary Research and Educational R&D methods were used to collect data for the first, second and third questions respectively. The suitability of the selected methods is discussed in details in the subsequent sections. Research design, including study type, strategies, and analysis techniques are main components of this thesis methodology chapter.

Research Design

The research questions had a consequential connection. The outcomes of the first and second questions prominently contributed to answering the third, hence, the development of the manual. Furthermore, the nature of the study was divers. It involved key distinctive aspects which covered the exploration of museum resources, national curriculum, and empirical studies of relevant practices that together influenced the content of the developed manual. These profound dependence among the questions and the diversity of the explored aspects entitled the study to execute a comprehensive research approach exemplified by a mixed-methods methodology.

Research Type

Mixed-methods methodology between qualitative and quantitative strategies was performed. This sort of technique is usually adopted in studies due to its feasibility of diminishing studies' limitations caused by implementing single approach; in addition to its nature of integrating numerical data and descriptive practises (Creswell, 2013). According to Cheryl and Denise (2010), qualitative study is adopted to give in-depth exploration of experience and/or cases, which complements what this research was aspiring to answer. Moreover, quantitative method is usually used to quantify and explain a case through collecting numerical data (Sukamolson, 2007). Therefore, a blend of quantitative and qualitative data collecting methods were considered appropriate, therefore, adopted to develop a comprehensive study. The following sections unfolds each question's strategy in depth.

Research Strategy

As stated in the preceding segment, for the questions to be answered, different methods for data collection had to be used. Innovative methodology approach had to be implemented towards holistic execution of the research objectives. A mixture between Systematic Review, Documents Research as well as Educational R&D were selected to answer the first, second and third questions respectively.

To answer the first question, "What are the factors and practices of effective instruction in collaboration with museums?" Systematic Review method was implemented. According to Tawfik (2019), the main concept of this research method is that it uses data from published studies on a certain topic to get adequate answers to a raised question. Exploring empirical studies from around the world contributed to collecting data with a variety of instruction practices and styles.

Sampling Strategy

A systematic search for relevant published studies about teachers and students' utilization of museum resources was conducted. To ensure a logical, comprehensive and even procedure, a search plan using Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were implemented. PRISMA statement and checklist illustrate in details the different steps to conduct systematic review, which ultimately helped in finding proper studies with practical procedures. To kick-off the search process, a list of phrases was formed, in Arabic and English languages, to be used in the search phase. The list included: "museum education and schools", "school and museum partnership", "integrating museums into classrooms", "teachers' experiences with museum education". In addition, different search engines and databases were used to find empirical studies in both languages such as ERIC, Google Scholar, JSTOR, ProQuest Education Database, and EBSCOhost. Search criteria were restricted to two main standards which are studies' publication date and inclusion of specific words. The details of selection criteria and data finding techniques were as follows:

Inclusion and Exclusion Criteria

The reviewed studies were those published within the recent decade, in the range from 2014 to 2024 towards exploring contemporary integration styles and museum education practices. In addition, the explored text included the terms or implications of 'Museum', 'school', 'teaching', and 'effective'. Studies were included if they investigated schools' utilization of museum resources. Moreover, the inclusion criteria for the review were:

- Primary source in the form of empirical study.
- The study concerns grade 1 - 12 level teachers and/or students.
- The featured experiments took place during schools' academic year.
- The adapted approaches proved the educational collaboration effectiveness on teaching-learning experiences.

The criteria of a study's exclusion were:

- Literature review or other secondary source was the main methodology.
- The study's sample are KG or university students.
- The utilized virtual museum does not exist physically.

Data Extraction and Analysis Techniques

To investigate the teaching and learning styles featured in the empirical studies, six main categories of key variables were established which are:

1. Studies' date of publication
2. Geographic location of the conducted study
3. Museum-school partnership site
4. Frequency of the partnership
5. Implemented teaching-learning practice
6. Factors that impacted the collaborative experience

Secondary categories were created for elements that have the possibility to influence the interpretation of the factors and practices. These categories were resource, a study's resource type, language, school subject, school grade and museum theme. Following finalization, a table was created using the main and secondary categories as headings. The final look of the created and used table can be seen in Appendix B.

Furthermore, to have consistency and structure to the textual analysis, the eight steps process of coding stated in Creswell (2013) were applied. The employed teaching-learning style and partnership site categories and codes can be seen in Table 01 and Table 02 respectively.

Table 01. Categories of Museum Teaching-Learning Practices

Teaching-Learning Type	**Description**
Tour	A classic guided or self-guided walkthrough museum galleries and exhibits, either all or selected, based on the visit purpose.
Interactive Tour	A tour inside the museum galleries where additional activities and techniques are included, thus, students are active learner and have a major role to the experience.
Workshops	Active sessions that involve multisensory practices to develop and implement knowledge.
Collaborative Project	A joint program between a museum and school where both organizations work together towards producing a mutual outcome such as an exhibition.
Outreach	Museum initiative or personnel offered programs outside the museum premises.

Table 02. Categories of Museum-School Partnership Site

Location	**Description**
On-site	Field visit to the museum to execute an educational program.
Off-site	Museum resources such as staff and/or collection visit schools and other non-museum locations as outreach initiatives.
Online	Distance learning without necessarily having direct contact with museum personnel.

The chosen research method resembled in Systematic Review was a weighty choice that allowed collecting valuable experimented data to answer the first question. Published works from different countries were explored and data were extracted using procedures suggested by the universal PRISMA strategy. The guidelines provided directions and acted as an action plan for this phase of the research considering the number of papers that had to be scanned and the type of information to be retrieved. Moreover, codes and categorizes were created to group the collected data. Nonetheless, this entire procedure was exclusive to the first question, and different methods were used to obtain information relevant to the other two questions.

To answer the second question, "What strategy can be used to integrate QM resources into government schools' instruction practices in Qatar considering constructivism philosophy" Document Research was conducted. This method is about the utilization of documents such as text, objects, materials, and/or other resources to provide information (Scott and Marshall, 2009). Due to the lack of resources and published studies on the main topic of the present thesis, the use of primary resources was a rational option, thus, was considered. In addition, thematic analysis technique and the coding method were used to extract and analyze data. This approach is usually associated and performed as an integral part of quantitative and qualitative document research (Morgan, 2022). Data from government schools and QM, in the forms of textbooks and galleries' content respectively, were investigated for this study.

Sampling Strategy and Selection Criteria

The question needs an answer on how to integrate museums' resource into classroom practices. Although this study is dealing with educational institutions, they

operate through different organization cultures. To integrate or connect the two learning cultures, common factors had to be identified. Consequently, content analysis technique was performed. It involved recognizing the themes featured in QM galleries and diagnose the existence of these themes within the national curriculum textbooks.

Qatar Museums Entities

The museums' collections, educational offers and online materials were explored. To conduct document research about QM entities, first an online search through the entities websites was completed towards having an idea about the nature of each entity. The second step was to set up criteria or standards to decide on the entities that would be relevant to museum-school partnership. An entity must meet minimum four out of the six established aspects to be selected, for details see Table 03.

Table 03. QM Entities Selection Criteria

Aspect	Description	Yes/No
Operating	The museum building or site is open for groups to visit and explore	
Objects on display	There is a permanent collection on public display	
Online Materials	There are resources available on the entities digital platform(s)	
Education Programs	Activities are offered that engage learners with the collection and galleries in a variety of ways	
Education Personnel	There is at least on staff member dedicated to the entity's education affairs	
Learning Spaces	The entity includes dedicated learning space for groups to use during a field visit for different purposes	

Government Schools' textbooks

For this resource, the study followed a systematic sampling of the national curriculum. Grades 1-12 textbooks for the academic year 2023/2024 were analyzed. The investigation focused on 1st semester texts, involving five subjects which are Arabic, Islamic Studies, Mathematics, Science, and Social Studies.

Data Extraction and Analysis Techniques

Qatar Museums Entities

Data were collected from four QM museums; they were the only QM entities that met the required criteria. The searched museums were Mathaf, MIA, NMoQ and QOSM. To explore the educational resources available in the museums, five codes were created as follows:

1. Museum type
2. Number of permanent galleries
3. Main presented themes
4. Galleries and museum's featured resources
5. Learning facilities

A table was created featuring the above elements that was used in the process of data record (see Appendix C). To collect the needed information, a schedule was created and followed to visit the four museums in person. Day 1: QOSM, Day 2 & 3: MIA, Day 4: NMoQ and Day 5: Mathaf. In addition, the museums' digital platforms demonstrated by the website and social media verified accounts were searched to obtain relevant information such as online learning materials.

Grades 1-12 textbooks

Deductive approach of research was used to categorize and sort the collected data. Objective coding was adopted following museums' themes. A list was prepared that included the identified themes from the museums' exploration mentioned in the previous segment. For the purpose of validity and reliability, the list was verified by eight experts from the museums and academic fields (Appendix D). The shared comments were taken into consideration and the list was updated accordingly (Appendix E). Moreover, the next step was the texts' analysis. The mentioned textbooks were scanned and analyzed using spatial content analysis. It involved exploring how much a topic occupy a page, that calculation was carried considering that a page covers 30 lines. Two assistances were trained to support in this process for the purposes of data validation and reliability of the research findings.

The selected method of original document research made data collection a possibility for a topic that is relatively new. The adopted technique of analyzing the content of the museums and using the extracted information to analyze the textbooks helped in recognizing a common ground between the two educational ecosystems.

To answer the third question, "What are the key components of a user manual to support effective instruction for government schoolteachers in Qatar through the utilization of museums' resources?" a product or service development methodology had to be followed. Borg and Gall (1983) stated Educational Research and Development (R&D) was found to be suitable for this study's objectives, thus, was adopted. According to the authors, this method has an industrial origin in product development where research findings are used to develop or enhance products. Nevertheless, Educational R&D was later introduced; it was influenced by the original industrial

version with the focus being on teaching-learning affairs. In addition to the method's synchronization with the study purpose, its structured process provides step-by-step guidance towards the design and distribution of the manual. Educational R&D approach model includes ten main steps which are: 1. Definition of educational service/product goals 2. Analysis of matters linked to achieving the goals 3. Analysis of the service context such as the teaching-learning setting. 4. Transform the goals into objectives relevant to different stakeholders 5. Development of assessment tools 6. Conduct field test with end-users 7. Development of supporting materials to enhance service implementation 8. Evaluation of the service after the test 9. Review the service performance, and finally 10. Design. These are the steps of a full-scale model design product. However, due to the scale of such educational projects, the authors recommended for a thesis and dissertation to scale down the R&D plan. One of the stated suggestions is to limit the process to fewer steps.

There are several recorded studies that conducted a small scale of the model process. Researchers and product developers in the educational field modified the steps according to their studies' needs with an average of five steps and the minimum reaching to three steps only (Gustiani, 2019). Based on the objectives of this study, the components of the manual were created using the following steps:

1. **Identification of the manual's significance and goal.** This initial step involved literature research about museum-school relation in Qatar as well as its implication internationally. In addition, the search included investigation on the function of manuals in spreading knowledge among practitioners. The explored literature influenced the key goal and objectives of the developed manual.

2. **Analysis of museum-school educational partnership practices.** As a second step, best practices, previous studies, and existing literature from around the globe were reviewed to provide a framework for the identified instructional design. It was essential to understand and benefit from the available knowledge about such educational partnerships to build upon.
3. **Analysis of the museums and government schools' resources.** The third step was dedicated to understanding the local context of the instructional design and its linked matters. The properties of museums and government schools in Qatar were analysed towards providing relevant and holistic instructional design and manual.
4. **Development of strategies to support teachers' utilization of museum resources.** The fourth step focused on the production of a practical system, comprehensive guidelines, and valuable information for the practitioners about effective utilization of museum resources.
5. **Manual design.** In the last step, the process of the manual production was executed taking into consideration the content quality and visual look. The content was structured to include the results of the second, third and fourth steps of the performed development cycle. Moreover, the designed manual was shared with six persons, from both the academic and museum fields, to assess its suitability and practicality. Two professors from the College of Education at Qatar University, two museum education personnel from QM, and two schoolteachers reviewed the developed manual. The comments were positive and agreed on its efficiency for museum resources integration into classroom practices. However, four of the reviewers suggested that the manual should be translated into Arabic.

Educational R&D process and steps are well-suited approaches to answer the

third question of this thesis. The method was conceived as monitor and checklist to develop the manual in both academic and systematic ways. Consequently, the process that led to the making of the proposed manual was profoundly research based.

The Researcher

The researcher works in the museum education field, specifically in the learning department. Among the job responsibilities is to design, develop and supervise a variety of learning experiences for school students and teachers in Qatar. In addition, the researcher has supported school personnel through museum workshops in utilising museums' resources in teaching and instruction practices.

This chapter demonstrated the followed research methodology in conducting the present thesis. It showcased the research design through the exploration of the used types, strategies, data collecting methods and other performed approaches. Chapter 03 content embodied the backbone for the entire study as the following sections depend profoundly on its conducted work. As was stated at the beginning of the chapter, the key research questions are distinctive, thus, different research methodologies had to be adopted. A mixed methods approach manifested in systematic review, documentary research and Educational R&D designs were used to provide data for the first, second and third questions respectively. The first question involved 31 published studies to extract data, in contrast the second question had to depend significantly on primary data. The third question applied the Educational R&D method due to the nature of the required outcome.

Chapter 04: Results

This chapter presents the study's questions' results based on the explained methodology in the previous chapter. Results in any context, it could be a medical, exam, experiment, etc., are expected and anticipated. They are often given in the form of symbols, numbers, or other abstract method. It is the procedure of placing these abstractions in context that brings out a comprehensive meaning out of them. In Chapter 03, data were collected and analyzed using a variety of techniques which are Systematic Review, Document Research and Educational R&D. The gathered data were about school-museum practices, government schools and museums common ground(s), and the development steps for an educational manual. This chapter discloses the findings through a collection of texts, graphs, and tables in the following sections.

First Question: What are the factors and practices of effective instruction in collaboration with museums?

The information which answered this question was collected through adopting Systematic Review methodology. In total of 94 empirical studies were initially gathered and explored; however, after a careful resources' screening process, 31 studies met the criteria and were utilized for this work. Appendix F includes the list of studies and their codes. The inclusion and exclusion criteria helped in the exploration of relevant studies but at the same time affected the number of gathered Arabic resources profoundly. Hence, out of the 14 found Arabic studies only two met the pre-set conditions. There were a couple of main reasons for the big drop in the number of Arabic resources which are, 1) the museum-school partnership was through virtual museums that did not exist in the physical world, and 2) the studies' samples were KG or university students.

Nonetheless, the 31 selected studies' results are illustrated below. This section's results begin with reporting the characteristics of the published studies to be followed by the methods of museum resources utilization.

Studies' Geographic Scope

To get a perspective on the cross-national educational diversity of the selection, Figure 06 gives a visual representation of the studies' geographic context. As shown, the chosen studies were from 12 different countries which are Australia, Canada, Hong Kong, Italy, Oman, Philippines, Portugal, Qatar, Spain, Turkey, UK, and USA. Diving into the numerical details, the number of studies vary per country with the highest being USA. There were 11 studies included from America, which is almost 35.5 % of the gathered samples. In other words, almost one-third of the samples' county of origin was USA. The second highest number in countries' samples involvement were Turkey and UK, where each was represented by four studies in the data collection. As for the rest of the featured countries, each was represented by either one or two studies. It was mentioned in the introductory part of this segment that there were only a couple of Arabic resources, which were conducted in Oman and Qatar. Furthermore, on the numerical data, the range between the highest and lowest number of featured studies per country is ten, which is considered wide considering the nature of this study; specially with the mode being one. These stated numbers and statistics were taken into consideration when interpreted the results that are enclosed in chapter 02.

Figure 02. World map with indication of the studies' countries names and number.

Studies Years of Publication

The recentness of the empirical studies' is demonstrated in a bar chart of Figure 03. For this thesis, the time range of the selected studies was a decade of publications in the years between 2014 and 2024. In analyzing the number of selected studies with relation to their year of publication, the chart exhibits a noticeable number of the empirical studies being published in 2016. This means the year is the mode among the collected resources. 2016 was followed by 2015 and 2020 with five selected studies from each. The ratio of study:year keeps descending until it reaches 1:1 for the years 2019 and 2022. As for the years 2023 and 2024, they did not mark an entry, thus, were disregarded in the analysis. Moreover, the studies' median is 2017, and as can be seen in the graph there is a positive skewness distribution. In plane words, most of the studies were published before or during 2017.

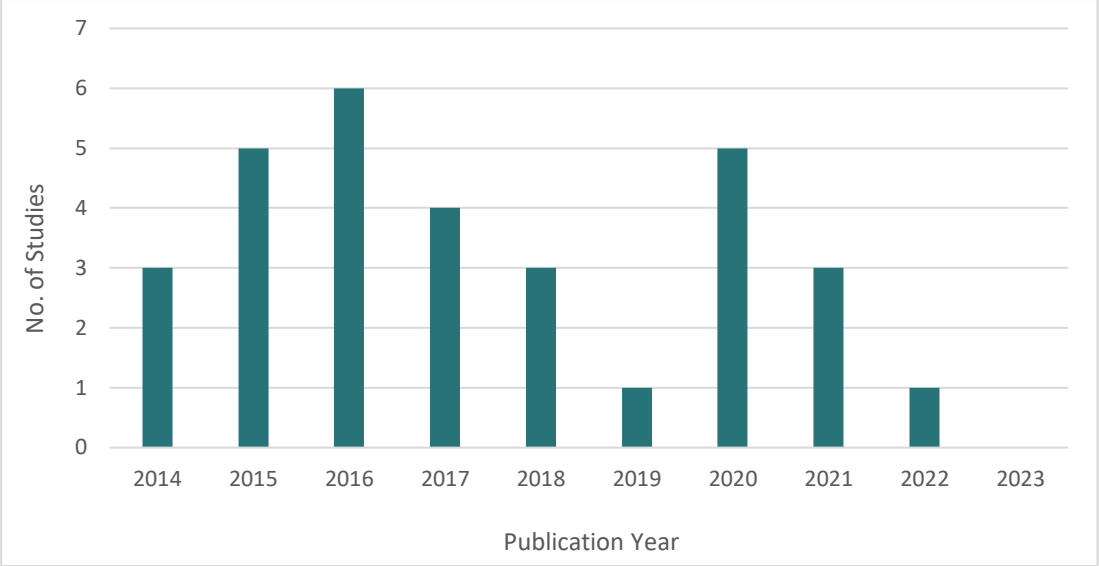

Figure 03. Bar graph of the empirical studies' year of publication.

Museum-School Partnership Frequency

As discussed in Chapter 02, educational partnerships take many forms and durations depending on the museum, school and classroom philosophies. The collected empirical studies were conducted in different countries; hence, a variety of educational ecosystems were involved. The pie chart in Figure 04 illustrates the frequency of the schools' utilization of museum resources during a study. Towards having feasible analysis, the collaboration frequency was categorized to 'one time' utilization, 'two-to-three times' or of 'more than three times' encounters. Reading the presented chart, the one-time visit shows a significant share, more than half of the pie. This category had 17 entries which suggests its substantial nature in such educational collaborations. However, the more than three times of utilization came second with a noteworthy occupation of the chart, almost one-third of the empirical studies. Leaving the two-to-three times with limited slice in the pie. These variations in representation enabled a comprehensive interpretation of data in the following chapter.

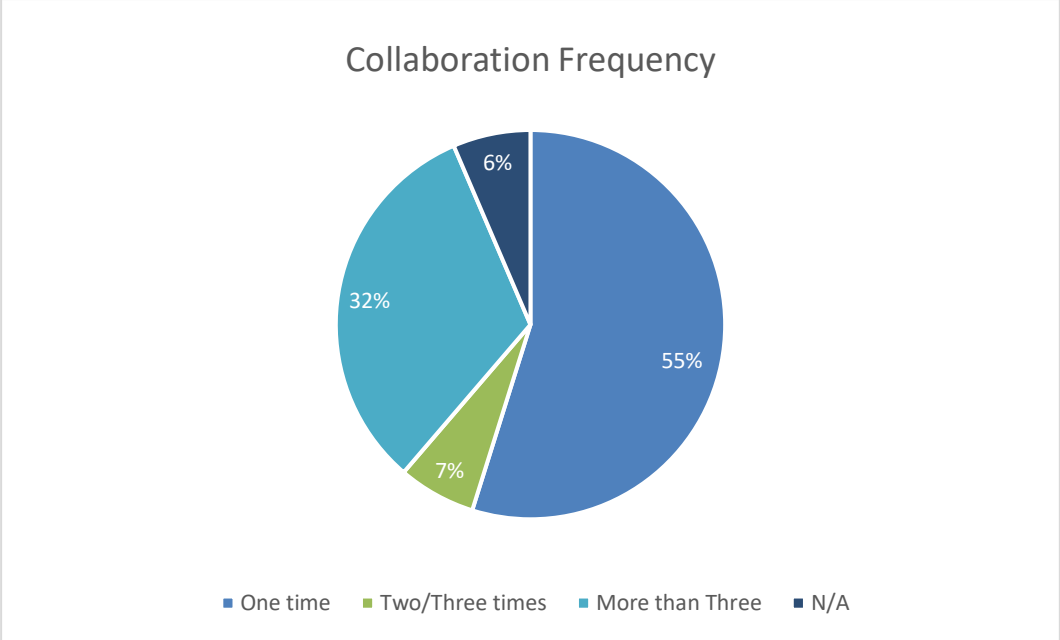

Figure 04. Bar graph of the frequency of museum-school partnership during a study.

Utilized Activity Type

Figure 05 bar chart exhibits the museum-school collaborative activities types. The x-axis shows the featured activities, while the y-axis quantifies the corresponding number of utilizations. Notably, the 'combination of two or more types' bar stands out the most triples the other activities. This could imply that this sort of activities possesses characteristics that appeal to museums and/or schools. Moreover, both forms of tours show balanced level of utilization, with a single point difference. The same observation goes to the rest of practices, with slight variations among them. This result and its interpretation in the next chapter guided the manual content to meet the preferences of the local educational entities.

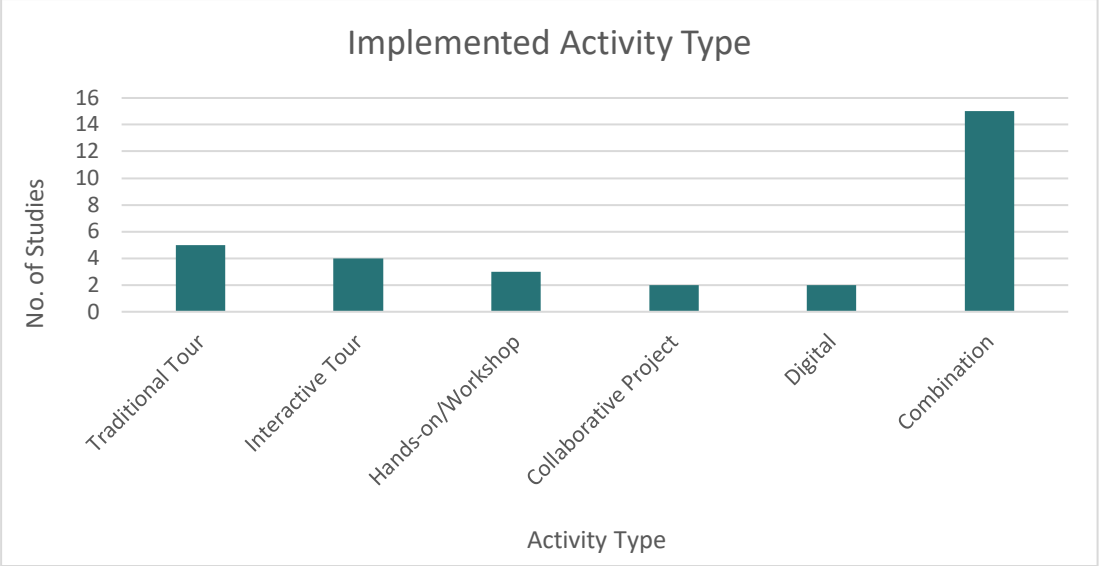

Figure 05. Bar graph of the empirical studies' featured activities.

Partnership Main Site(s)

Museums and schools each has its own prominent location, physical and/or virtual, for the partnership activities to take place. The conducted activity's environment affects its rate of utilization and intended teaching-learning objectives. The pie chart illustrated in Figure 06 shows the sites of the implemented activities within the empirical studies. As presented, the dominant slice of the pie is dedicated to museums' on-site utilization. This site was stated in 17 studies for being the key collaboration location. Moreover, the second largest slice of the pie would be the combination of various sites. For this category to be indicated in 9 studies suggests the interest of dynamic collaboration between the educational cultures where they showed interest in blend between different sites. Furthermore, the slices representing off-site and online locations exhibit relatively similar sizes, with 3 and 2 represented studies respectively.

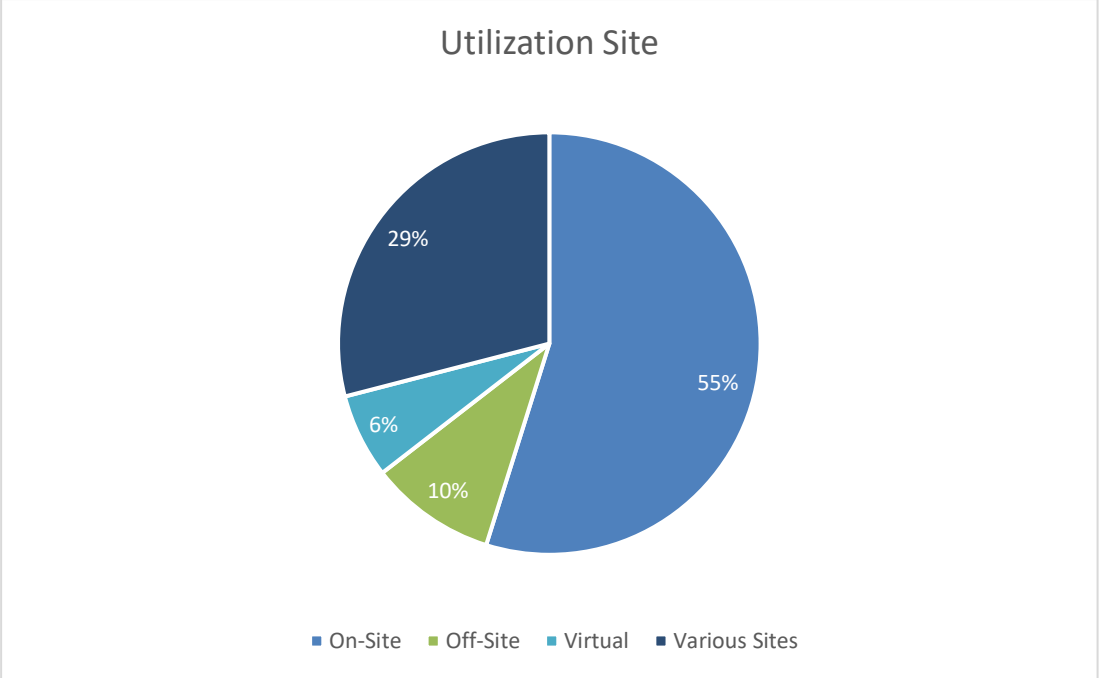

Figure 06. Visual representation of the empirical studies' featured activities' location.

Utilization of museum resources factors and practices

Some of the main factors were pre-categorized, addressed and investigated such as the collaboration frequency, activity type, and implementation main site. Nonetheless, there were additional reported factors in the empirical studies which can be found in Table 04.

Table 04. Factors and Practices Stated in the Empirical Studies.

Reported Factor	**Interpretation**	**Studies Code No.**
Real-world experiences	Museums brought things to life and provided students with experiences within real world context. For instance, engaging with the exhibits or museum staff was an opportunity to implement gained skills in real-world scenarios.	Code 01 – Code 02 Code 06 – Code 09 Code 10 – Code 14 Code 21 – Code 24 Code 27
Pre-visit & after visit	Having pre-visit and post-visit activities linked museums utilization with classroom practices. In addition, adopting these approaches helped in preparing students for the field visits and in knowledge assessment conducted after the visit.	Code 05 – Code 07 Code 11 – Code 15 Code 16 – Code 19 Code 31

Reported Factor	Interpretation	Studies Code No.
Teachers	Teachers' involvement in the delivered activity and their prior knowledge of museums and their services are fundamentals of effective collaborative activities.	Code 01 – Code 12 Code 27 – Code 30
Time	Planning museum-school collaborative programs is time-consuming. In addition, some school groups required extra activity time.	Code 01 – Code 02 Code 03 – Code 23 Code 25 – Code 26
Relevance to Curriculum	Museum offers and partnership activities must be linked to the curriculum	Code 01 – Code 03 Code 24 – Code 25 Code 27

The preceding segments illustrated the empirical studies' findings, which provided insights into the various teaching-learning methodologies within a museum-school partnership. The gathered data were derived from a variety of educational systems worldwide where the analysis underlined the factors and practices of effective museum utilization strategies. Nonetheless, the next part is dedicated to museum and school resources that are exclusive to the State of Qatar.

Second Question: **What strategy can be used to integrate QM resources into government schools' instruction practices in Qatar considering constructivism philosophy?**

Document research is the applied method that was used to collect data towards answering this question. Primary resources had to be investigated demonstrated by museums and the national curriculum contents. There were four museums visited and 74 textbooks explored to extract data. The results in this section starts with reporting the findings of the four museums to be followed by the national curriculum textbooks.

Qatar Museums resources

Museums are established to provide communities with cultural and educational experiences. Their resources and themes vary which increases the diversity and number of experiences. The collected data were extracted from visiting, physically and virtually, the four operating museums which are Mathaf, MIA, NMoQ and QOSM. Table 05 includes the relevant gathered data. As shown, there are three types of museums dealt with in this study: two art museums, one national museum and one sports museum. Each museum has a number of galleries that each adopts a unique theme. In addition, most QM permanent galleries feature interactive learning areas, exhibits and materials for visitors to engage with. Moreover, there are designed educational programs that are offered to take place on-site, off-site and online.

Table 05. Museums' Learning Resources

Category	MATHAF	MIA	NMoQ	QOSM
Museum Type	Art Museum	Art Museum	National Museum	Sports Museum
No. of Galleries	05	18	12	07
Main Galleries' Themes	Arab Art Culture History (Arab World)	Culture Geography History (Islamic) Islamic Art Islamic Civilization Physical Science Religion	Culture Customs & Traditions Energy Geography Geology Heritage History (Qatar) Natural Environment	Culture Geography Health History (international sport) Sports

Category	MATHAF	MIA	NMoQ	QOSM
Featured Elements	Permanent Collection	Permanent Collection Interactive Exhibits	Permanent Collection Films Interactive Exhibits	Permanent Collection Films Interactive Exhibits
Learning Facilities	Library Education Room(s)	Library Education Room(s) Park	Library Education Room(s) Heritage Garden Playground	Library
Offered Programs	Workshops Tours Online materials Outreach Teachers Training	Workshops Tours Online materials Outreach Teachers Training	Workshops Tours Online materials Outreach Virtual Tours	Workshops Tours Online materials Outreach

Grades 1-12 textbooks

The national curriculum presented through school textbooks are the main tangible sources and references for students' learning. In addition, they can be perceived as an action plan for teachers to reach the school subject objectives and the authority set goals. There were five school subjects involved in the exploration, which are Arabic, Islamic Studies, Mathematics, Science, and Social Studies. There were in total 74 textbooks explored to collect data. Different grade levels have additional or a smaller number of textbooks per subject. Table 05 includes details on the matter.

Table 06. No. of explored national curriculum textbooks

School Subject	No. of textbooks	Comments
Arabic	12	Each grade level, for the first semester, is assigned with one dedicated Arabic textbook.
Islamic Studies	12	Each grade level, for the first semester, is assigned with one dedicated Islamic Studies textbook.
Mathematics	17	Grade 1 – 5 each has two books designated for mathematics during the first semester, while grades 6 – 12 use one textbook per semester.
Science	21	For grades 1 and 2, one textbook for the first semester. Grade 3 – 9, each has two textbooks for the first semester. Grade 10 has three books, covering Biology, Chemistry, and Physics separately. Grades 11 and 12 following literary path, one textbook is assigned per semester.
Social Studies	12	Social Studies is introduced from grade 3 onwards, resulting in grades 1 and 2 lacking a designated textbook for this subject. However, grades 11 and 12 each has two textbooks, one dedicated to geography and the other to history.
Total	**74**	

Based on the analysis of theses textbooks, the average percentage of the common themes between museums' galleries content and the national curriculum was almost 29%. The main researcher, assistant 1, and assistant 2 results were 28%, 30.4%, 29% respectively. The three results are very close, with a range of 2.4%. Table 08 shows the researcher's results of the mutual themes between the national curriculum and museum per subject.

Table 07. Percentage of the national curriculum and museums' mutual themes.

Textbook	Total Number of Pages	Numbers and Percentages of Pages Themes Occupy	
		#	%
Arabic	1794	501.45	27.951505
Islamic Studies	1618	353.85	21.8695921
Mathematics	2445	338.6	13.8486708
Science	2462	612.6	24.8822096
Social Studies	1785	1024.2	57.3781513
Total	10104	2830.7	28.0156374

As can be seen in the table, the most added value among subjects was Social Studies, followed by Arabic, Science, Islamic Studies and finally mathematics. There was a variety of percentages between the listed subjects, specifically considering the highest and the lowest contributed values. However, for Arabic, Islamic Studies, and Science the percentage were within the same range of 20s. Furthermore, the average percentage per subject as presented by assistant 1 and assistant 2 can be viewed in Appendix G. Besides, number of common themes' pages per subject by the researcher, assistant 1 and assistant 2 can be found in appendices H, I and J respectively.

As exhibited in the mentioned appendices, the dominating themes are Geography & Topography and Ecosystems, Flora & Fauna. Together the two themes make in total 845.45 pages out of the 2830.7 pages of the relevant content. That is 29.86% of the results which is a significant amount of featured data. On the contrary, there were themes featured in QM galleries that were either slightly featured or not found in any of the textbooks such as Ceremonial Practices, History of Sports and Mythologies. Nonetheless, some themes had notable presence such as Sports &

Games, Materials & Mediums and Islamic Faith, jointly making 14% of the collected data.

In general, major and slight percentage of themes' presence are both considered common topics between museums and schools. Thus, all recorded themes regardless of their numerical contributions are valuable indicators. Moreover, the next chapter elaborates on these findings and discusses the unique value of the topics that were in common between the two organizations.

Third Question: What are the key components of a user manual to support effective instruction for government schoolteachers in Qatar through the utilization of museums' resources?

The performed research method was Educational R&D that included five key steps. The result of the structured research process was as follows:

1. **Identification of the manual's significance and goal.** The result of this step in the process was presented in the Introduction and Literature Review chapters of the present thesis. In Chapter 01, the study's goal, questions, objectives, and significance were the outcome of the performed work to identify key matters related to the manual development. In addition, the involved theoretical framework and existing literature in Chapter 02 were conducted to support the requirements of this step.
2. **Analysis of museum-school educational partnership practices.** This step's result could be found in the section dedicated to Question 1 results. The 31 explored empirical studies and their data analysis were performed as part of this manual design step. The extracted knowledge from the empirical studies

contributed to the development of the instructional design and the content of the proposed manual.

3. **Analysis of the museums and government schools' resources.** The designated section for Question 2 in this chapter enclosed the found results of the third step. The available resources from museums and government schools in Qatar were investigated and analysed providing knowledge and insights about the setting of the implemented instructional design and the manual guidelines.
4. **Development of strategies to support teachers' utilization of museum resources.** The developed strategies were based on the results of step 2 and 3 of the manual design process. There were guidelines and original tools developed to support government school teachers in the practice and to enrich the manual content with customized strategies for the manual project stakeholders
5. **Manual design.** The major result of this development process, and generally this thesis, was the manual design. The findings from the three study questions and the four preceding steps were contextualized to develop the manual content. The proposed manual can be accessed by clicking or scanning the below QR code.

Figure 07. QR Code to access the developed manual.

Chapter 05: Discussions and Recommendations

Museum resources integration takes many forms and happen in different places beyond classrooms. So far, the previous sections explored the integration of museum resources as an instructional design to complement and promote inventive instruction. The purpose of this study was to develop a manual that can assist government schoolteachers in Qatar through their journey of utilizing QM resources. The study was directed by three central questions where each highlighted a distinct approach of the topic, consequently, different sorts of information were extracted and analysed. Without further ado, this chapter discusses the research findings, implications for practice, recommendations and provide suggestions for future research.

Discussions

The following paragraphs contextualize the findings of the raised questions considering the study's main subject. The results would be interpreted in relation to the literature review and other questions' results. The previous chapters had revealed that there are common grounds between the two educational ecosystems and that there are factors that would foster collaborative instruction. Recognizing the factors and practices based on empirical studies would help teachers to design lessons in partnership with museums while avoiding the reported challenges. In addition, museums and schools with their unique systems require a customized strategy to integrated and design lessons. By tackling these aspects, the manual content involved insights to the field of educational partnership as well as provided practical approaches to support government schoolteachers in Qatar.

First Question: What are the factors and practices of effective instruction in collaboration with museums?

The utilization of museum resources is a fluid concept, it could occur spontaneously through unplanned interaction with an exhibit for instance or through a holistic detailed planning in advance. However, to understand the degree of integration, elements such as factors and practices should be recognized. In Chapter 03, relevant elements were identified either through deductive approach of pre-set categorizes or inductive approach of variables that were reported in the studies. The following paragraphs present the found factors and practices in the context of museum-school partnership.

Starting with the pre-set categorizes, which included the studies' geographic scope, publication date, partnership frequency, activity type and site. The geographic scope of the empirical studies was analyzed and presented in the form of a map to show that museum-school partnership is a universal pedagogical activity and that it is not exclusive to a certain location or culture. Therefore, the education authority in Qatar can establish the foundation of integrating museum offerings into their teaching-learning practices and become among the nations that support similar interdisciplinary partnerships. Although USA presented almost one-third of the samples, however, this could be attributed to several reasons such as the country having longer history in museum education practices, being active in studies' publication field, and/or other reasons. Moving to the date of publication, all of the featured studies were published between 2014 and 2022 as an attempt to identify elements that are relevant to modern days' trends. Accordingly, the found results on the scale of pedagogical period can be considered as relatively recent utilization factors and practices.

Moreover, this segment focuses on how frequent museum resources were

utilized. As mentioned in the previous chapter, the frequency in this thesis context refers to the number of museum resources utilization within a case study, not a unified period like an academic year. The two organizations hold the possibility to collaborate once or multiple times throughout a period of time, it depends on the objectives and the motive driving the partnership. The results illustrated in Figure 08 showed that there is a clear dominance of utilization frequency for one-time. Such limited utilization could be influenced by the found factors for instance restricted teaching time or incomprehensive teacher's knowledge about the available resources. Nonetheless, it is also worth noting that the results' second dominant area was for over-three-times category. This suggests that school groups stray away from moderation, they either adapt mild or profound commitment to the partnership. These practices influenced the integration technique presented in the manual which provides teachers the autonomy to utilize museum resources regardless of the circumstances.

Furthermore, the implemented activity type is at the core of the museum-school partnership practices. It is where instruction methods play a major role, especially since it is the approach a teacher or museum educator chose for students to acquire knowledge. The activity type is the vehicle for information transformation from an exhibited artefact for instance to the student. The right selection of the vehicle is the arbitrator to making the students learning either active or passive.

The graph in Figure 09 clearly showed that a combination between different activity types is the most practiced approach in the empirical studies. The combination type is in fact a mix of the other presented forms in the graph, such as the engagement with a guided tour and workshop in the same visit. The blend between types perhaps is the most suited for museum-school partnership scenarios where classrooms themselves

have a blend of different students' learning styles. Following a combination of activities approach increases the possibilities that students would understand concepts and express based on their primary learning style. Moreover, the notion of combining two or more types together has a strategic advantage which is teachers can utilize the museum resources in a variety of ways within a single encounter. However, it must be noted that the most often used type is not a synonym to the most effective. For example, several of the explored studies (Code 5, Code 7, Code 31) implemented interactive tours, which is a single type. Usually in theses tours educational activities or elements are involved that compliments the galleries' walkthrough to keep the students actively engaged. An example was explored in Chapter 02 by Charitonos, where students had to write about the exhibits and the galleries' experience in Twitter/platform "X". These kept students engaged with something they are familiar with and probably encouraged some to look closely at the collection to tweet about something interesting. The creative approach also gave the teacher materials to assess the students' learning. The hands-on activities and workshops are just like interactive tours in the sense that they involve multi-sensory interaction with the objects. In such active programs, students could not possibly be passive learners as information has to be explored and implemented using different skills during the field visit. The other form, collaborative project, is simply a series of combination activity types, performed over a long-term. What is special about it, is that the outcome could take the form of legacy project like an exhibition commemorating the joint work. In general, museum-school partnership depends greatly on the teacher's viewpoint behind the design of the instructional style and collaboration objectives.

Nonetheless, despite being one of the most manageable programs museums offer, virtual digital offers were not as popular as other types. In Chapter 02, this form

of museum offerings was explored and the featured examples ensured its feasibility in promoting active teaching-learning. A possibility for the limited utilization could be the museums' uploaded materials are not robust to encourage application. According to (Harrell & Kotecki, 2015), museums online contributions must exceed uploading lesson plans. Subsequently, having a range of online materials such as digitized collection, digital educational games and virtual sessions are valuable resource for teachers to explore and build a classroom activities' around. More ideas were stated in previous chapters by Lewis (2020) about distance learning and how this resource could be integrated by teachers. There are limitless experiences offered and more could be developed based on schools needs and recommendations that can take place on-site or in school premises. The following paragraph study's the factor of location in this form of educational partnership.

The instruction site and environment with no doubt impacts the teaching-learning methods. As stated by Hohenstein and Moussouri (2017) in earlier chapters, being in museums influence active learning among students, therefore, knowledge retention. This makes the main location of collaboration another significant partnership factor. As illustrated in Figure 10, the chart is dominated by the utilization of multiple sites, to be followed by on-site. Actually, the studies which reported the utilization of multiple sites, included on-site activities with at least one of the other sites. So, approximately 84% of the featured case studies conducted field visits to the museums' premises during the collaboration. With such high entry, visiting the museums should be encouraged and emphasized by government schoolteachers in Qatar. Conducting a lesson, or a series of lessons on-site is a highly recommended practice either by book authors or numerical data. To make this practice practical, the effective integration of field visits is discussed in the section dedicated to Question 2 discussion. Furthermore,

the other two options were off-site and virtual. The matters with online and virtual resources utilization were tackled and discussed in previous parts of this thesis. However, off-site despite being a museum outreach activity by going to other venues in the community, still was not popular within the selected studies.

On the travelling exhibition case (2015), a stated result on the off-site experience was the quality of the exhibition, which did not match the museum's value. Among the recommendations was that museums should offer resources that bring a similar level of experience as being on-site. In addition, another reason for the limited utilization is that not all museums offer travelling exhibitions or have their collection available off-site. An example would be QM entities, the results in Chapter 04 showed no data entry for travelling exhibitions, this could be a reality to other museums around the world. In other words, what is not offered cannot be utilized. Furthermore, off-site and outreach programs can be implemented through the utilization of different museum resources including experts and replicas, that can be integrated in classroom practices. An example would be Charitonos (2019) published study, the class had a live session of virtual chat with a museum curator. Students were able to have a discussion with an expert about a relevant topic. Hence, museum field experts can be guest speakers to explore a lesson theme, answer students' questions as well as influence career paths. This example shows that teachers have a variety of choices to utilize museum resources from their classrooms. So far, the discussion undertaken museum utilization based on the pre-set categories; however, there are additional factors that were reported by the investigated studies which impacted museum-school collaborations.

The additional factors presented in Table 03 were as follows, real-world experiences, pre- and after-visit activities, evaluation, time, and teachers' knowledge. As can be comprehended from the table's interpretation section, the presence and

absences of these factors had either positive or negative impacts on the instructional design. For example, the existence of real-world experience had a positive impact. As discussed in the study of Fazzi & Lasagabaster (2020), students' attitudes and knowledge increased because of the involvement in a field trip and being close to reality. Students were able to implement their knowledge of a foreign language, gained from classroom practices, in a real-life scenario. However, creating a lesson or program that isolates learning from real world interaction would influence less desired impact on teaching-learning experiences. The dual sides of factors have equal strengths; however, with reversed powers. It is essential to state that it is difficult to label things as good factors or bad factors in such practices, perhaps a wise using or misusing of factors would be more accurate.

Furthermore, the two educational systems have pedagogical practices in common. For example, pre-visit and post-visit practices in museums are the counterparts of lesson's preparation and assessment in schools. Approaching museum-school instructional designs with a similar thought would bluer the lines between the two educational cultures. The significance of preparing students for a lesson and assessing their learning after the instruction session must not be dropped due to the utilization of external resources. Collaborating with non-education organizations does not affect the original protocol of developing a lesson, it affects mainly the way a lesson is performed. Having a common ground and reading each organization's educational elements can make the collaboration more feasible and approachable. In general, teachers follow this protocol for every lesson despite the taught subject, grade level and instruction style. On the contrary, evaluation is not performed as often over an academic year, yet, has powerful effect on the workflow of everyday lessons' execution.

Evaluation as discussed in Chapter 02 is a key issue when applying creative

instructional design or non-orthodox methods. Alternative assessment is the solution that is usually suggested and considered; however, some education authorities and decision makers assert that standardized test are the main assessment and evaluation approach. For a holistic and effective museum-school collaboration, government schoolteachers in Qatar can use the featured textbooks' exercises as interactive tours, pre-visit and after visit learning materials. The included questions' format and answering methods would familiarize students with the standardized tests. The way students extract the information would depend on museums resources, while the knowledge implementation can follow the format of standardized test and vice versa. For instance, the preparation and assessment activities could be conducted through using museum resources while the lesson instruction could exemplify the test requirements. There are different solutions, suggestions and adjustments schoolteachers can adapt to use all available resource effectively. This leads to the reported factor related to teacher's knowledge. The entire present thesis was conducted and the manual was developed to support teachers through knowledge acquisition and providing practical practices linked to the integration of museum resources.

Nevertheless, a factor that had equal positive and concerning reports is time. For a fourth dimension of space, time has a vigorous input on the proposed instructional design implementation. Based on the time factor, during the development of this thesis, a question was raised whether activity type category should had been coded by ranking rather than categories. For instance, activities that take 30 minutes, 90 minutes, 3 hours, etc. Even with an attempt of revisiting the 31 empirical studies, most did not mention the numerical duration a utilization took. There were some indications like one class period, or the time was not long enough. That was perceived as a challenge in the attempt of integrating museums in teachers' lesson instruction. This assumption is

critical and was treated through a proposed original strategy that can be found in the next paragraphs or accessed in the developed manual.

In conclusion, these factors should be monitored regularly and placed under the radar due to their profound influence over instruction practices. What were presented in Chapter 04 in the form of structured phrases, numbers and graphs can now be perceived as key players to influence effective integration of museums. The identification and recognition of factors and practices were extremely helpful, they are the foundation to build instructions upon. Moreover, international cases also serve as successful inspirations that government schoolteachers in Qatar can explore. The next section explains how the factors and practices discussed above can be integrated into the national curriculum.

Second Question: What strategy can be used to integrate QM resources into government schools' instruction practices in Qatar considering constructivism philosophy?

The factors, practices and procedures were identified, which provides a blueprint to start museum resources integration. It is in this phase where government school national curriculum and QM entities resources blend to generate teaching-learning experiences. This section starts with recognizing QM resources that teachers can consider when planning for their lessons. It then moves to a section dedicated to the national curriculum and government schools' textbooks. The end of this section focuses on techniques and strategies for applicable integration.

For QM entities, the results showed that there are in total 42 permanent galleries with a variety of themes. These include for instance history, geography,

science, and visual art. Moreover, the findings showed that three out of the four museums feature interactive elements such as films, interactive exhibits and tactile stations. These educational resources are imbedded inside and outside the museums' permanent galleries which could be utilized by teachers during a museum visit. In addition, the museums' educational programs offerings also vary in each entity which makes every choice a possibility to generate a unique experience. Nonetheless, the results showed limited diversity in the nature of the offered programs, especially those which could be suitable for distance learning. As mentioned previously, these online programs are valuable due to their benefits for teachers and students to be utilized outside museums' venues. In general, QM resources are diverse in terms of themes and learning resources which school groups can integrate into their daily classroom practices.

Furthermore, regarding the national curriculum, grades 1 – 12 textbooks are not less thematic than QM galleries' themes. As mentioned in Chapter 04, there are minor indications in the investigated empirical studies that linked between a museum theme and the taught subject despite the rational possibility of a direct relation. This could be due to cross-curricular practiced approach by some schools that does not segregate between subjects. Another possibility would be that some or international education systems designate one teacher for most if not all core subjects where cross-curricular takes place deliberately and circumstantially, therefore, any museum is a good source to a certain degree. A third possibility could be due to the insignificance impact the nature of a subjects has on the utilization on of museum resources. Thus, for this study, the integration was by linking themes and topics rather than school subjects as a sounder option.

Moreover, Table 06 showed the percentage of common themes between

the two organizations. This indicates that teachers can choose to collaborate with museums for different lessons. The results also showed that there were museum topics that were not found in the textbooks. These are great opportunities to expand students' knowledge with extra curriculum activities. Such activities are practiced in schools to enhance students' learning and diversify their knowledge. QM four operating museums and the other entities are suitable destinations for these programs. Overall, the findings indicate that most museum themes has its counterpart in at least a single content from grades 1 – 12 textbooks. However, as stated previously in Chapter 03, some topics within school subjects are concerned with skills development rather than information acquisition.

With regards to skills, this aspect comes with resilience. That means the examples used in teaching could be inspired from the museum collection and in some cases the skill in itself is featured. An example of using the collection for instruction, in teaching addition and subtraction instead of using symbols of fruits they can be replaced by showcased objects. It is a well-balanced situation for teachers and students as skills would be gained, and real-life knowledge would be acquired. Here again it depends heavily on teachers' philosophy, choices, and creativity. As in constructivism theory tenets, teachers are supporting and influencing learning to occur.

Furthermore, as explored in Chapter 02 the principle of constructivism theory says a human must construct, collaborate and/or be social for learning to take place. Rephrasing Piaget's and Vygotsky's psychological work in that fashion shows how surreal is the theory. Constructivism champions trial and error method as well as learning from/with the surrounding. It is important to emphasize that a more knowledgeable person should be around, so in classroom

environment teachers' involvements are irreplaceable. Museum resources integration could be all the scaffolding teachers have to offer learners to construct knowledge. Based on the discussed topics above, here are the things that learning personnel should do for solid scaffolding in the explored instructional design.

The possibility of the instructional design to support teachers in planning for lessons has already been explained. In addition, topics from government school curriculum textbooks are shown to what extent are related to the museums' contents. Transforming what had been discussed from theory to practice will be demonstrated by taking an example from one of the textbooks' topics. The selected topic is grade 4 lesson about Shaikh Abdulla bin Jassim Al Thani, the third ruler of Qatar. According to the findings in Table 05, the suitable museum would be NMoQ. The relevant galleries have primary resources, films, and interactive stations for teachers and students to engage with during their visit. There are exhibits dedicated to Shaikh Abdullah Al Thani and his ruling reign. In addition, the Shaikh's old palace is in the heart of NMoQ. In short, students can explore Shaikh Abdullah's life through his personal belongings; the entire lesson can be covered in a single field visit.

The above paragraph shows a great example that is ready to be implemented by grade 4 social studies teachers. However, scaling this example to the time factor would suggest that it is not effective instruction. As this collaborative activity is time consuming, almost two-three hours must be spent plus the preparation logistics will not add up for a lesson develop by MOEHE personnel to be covered in 45 minutes or so. As stated earlier, time was a reported factor that can impact the effectiveness of the instructional design. It is a valuable resource that teachers cannot and should not compromise. In the following

section, the same example will be revisited; however, time will be considered in this round.

Appendix K includes the curriculum themes, museums' themes, offerings, and teaching practices supported by constructivism theory. The sheet shows how the integration could happen with multiple possibilities through mix-and-match procedure of relevant themes and practices. A teacher should select a relevant element from each column to create the collaborative lesson. This technique gives teachers the freedom and creativity to develop a lesson plan.

For the selected lesson about Shaikh Abdulla Al Thani, the topic suggests that it is part of Qatar's history. Based on the information provided in Appendix K, NMoQ resources were selected. Here is the part where the type of integration is decided, hence, the time factor should be considered. A suggestion would be to calculate the weight of a lesson in relation to the time duration expected for the selected offer. This requires an equation and calculator. Nevertheless, a simpler option can be found in Figure 08, which is a developed decision matrix.

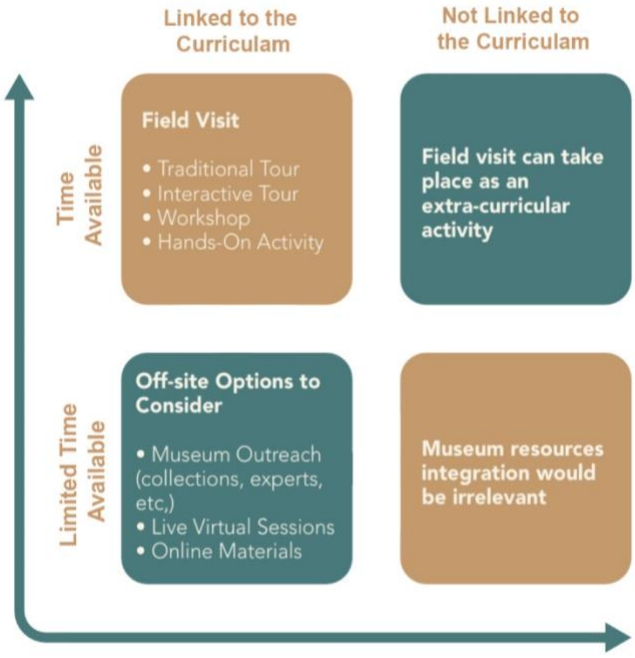

Figure 08. Decision matrix for museums' resources utilization

A teacher can choose the integration style by choosing what is relevant to the lesson weight. The first step is to choose one item that best describes the lesson topic in relation to the curriculum, either linked or not linked. The next step is about time, an estimation has to be considered either enough time is available for a field visit or it is not available. Based on the cross point a decision can be made. Appling the developed strategy on Shaikh Abdullah Al Thani lesson. In the first step it shows that it is linked to the curriculum; however, the second step indicates that limited time is available. The crossing point suggests considering one of the three options: outreach, virtual session or using online material. The decision matrix can help teachers make their choices easier. Moreover, a table that measures the weight of lessons that give a result that is considered a respond to teaching/partnership style would be ideal. Almost like the Table of Specification that is used for exam questions and number of items in a paper; however, in a museum collaboration case to replace the exam item part with collaboration type in relation to the calculated hours.

As for assessment, teachers can use the exercise pages in the students' textbooks as this grade level follows MOEHE test policy. Following the suggested strategies will ensure that practitioners perform effective teaching and not compromise any valuable instruction factors. Nonetheless, a field trip is still a possibility if the allocated time for the lesson is extended. There are two options to create more time, either covering multiple lessons during one field visit or since the same topic can be found in different subjects viewed from different angles, a visit can be cross-curricular and serves several subjects at once.

In the case of the selected lesson, the same textbook also explores the topics of the Establishment of the Emirate of Qatar, Al Thani family, Qatar-British

relations. Interactive tour with a specially developed worksheets, perhaps inspired from the textbook MOEHE featured activities would make an effective and comprehensive museum integration approach. In general, teachers should play different roles depending on the used resources, for instance, they could create their own interactive materials to support students during a field visit. However, in outreach they should collaborate with museum educators to develop the learning experience.

Furthermore, since this is an alternative teaching approach with several things to reflect about and be assessed upon, a good assessment tool would be creating a learning log about the selected topics. This is considered suitable due to the compiled lessons weight as it can help in assessing students' comprehension of a historical content through their own expressions. Each log entry can focus on different elements related to the textbook units such as the historical leaders' reigns, their characteristics, political events, social events and more. A rubric can be created for grading based on the preset requirements.

Integrating external organization offerings into formal organization teaching-learning practices has a possibly through careful implementation. A tool was developed for government schoolteachers that would make the museum resources utilization effective and within MOEHE guidelines. The technique and strategies of the developed tool have sustainable and feasible dimensions. The adaptation of these aspects is crucial as themes in textbooks and museums will be altered and/or increased. It was importation to provide integration solutions that embrace resilience and applicable to the changing scenarios which is what the developed tool resembles.

At the end, integrating non-formal education resources is a notion of

creativity and discipline. What is needed is a topic, museum resources and a theory to validate the teaching-learning methods. The success of such dynamic and innovative instructional design depends on the teachers' instruction philosophy and the organization's authority mandate.

Third Question: What are the key components of a user manual to support effective instruction for government schoolteachers in Qatar through the utilization of museums' resources?

Throughout the present thesis, the key subject was dealt with in structured chapters, sub-sections, and multiple procedures. However, through the development and production of the manual the study becomes a whole. The proposed manual is an embodiment of the present thesis. It is the effort of different research methods and innovative approaches linked to the development of a tangible reference for government schoolteachers in Qatar. Figure 08 shows the Contents page that features the main components of the proposed manual. Further elaboration on the selected components is stated in the next page.

S**ection 1** - This section gives an overview of the manual and insights on museum integration. The first half of the section includes general knowledge of matters such as museums, museum education and the significance of museum-school interdisciplinary collaboration at different levels. The section's second half features content about QM operating museums for teachers to design their instructions upon. The rationale behind involving such elements at the beginning of the manual was motivated by the empirical studies. The extracted factor which emphasized that teacher's comprehensive knowledge is essential for effective school-museum collaboration was considered and applied.

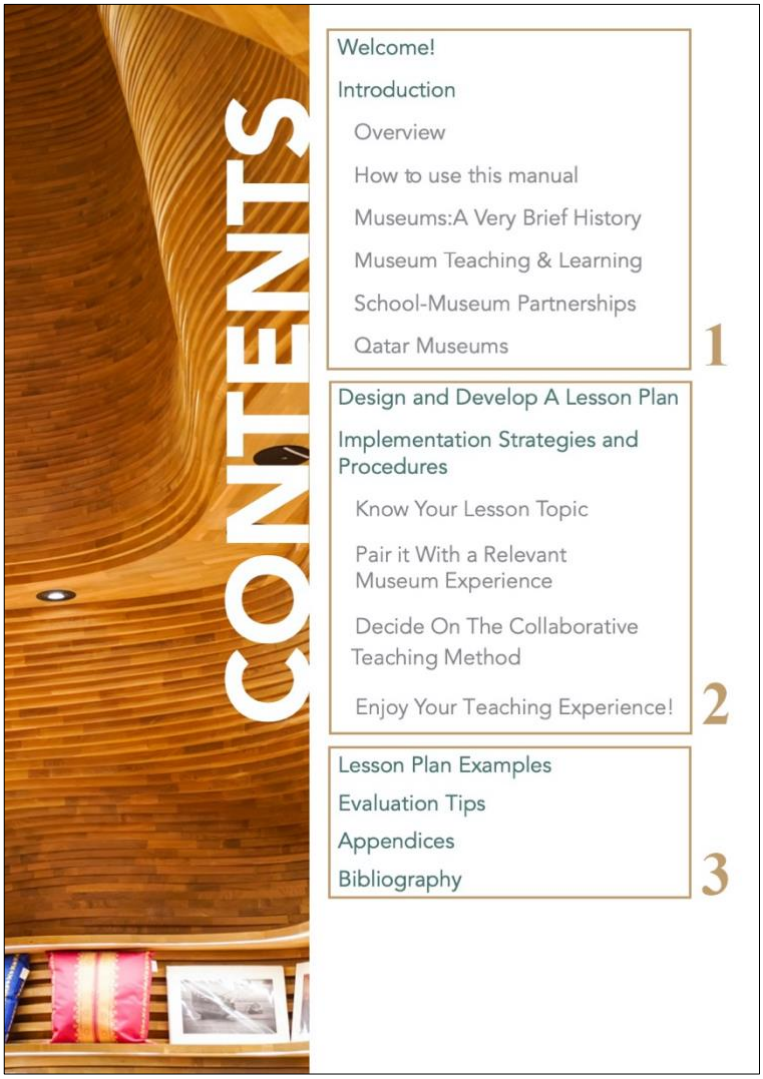

Figure 99. A sample of the proposed manual content page.

Section 2 - This section focuses on the strategies and procedures for integrating QM resources into government schools' classroom practices. The proposed strategies were customized to support government schoolteachers in Qatar. They were created based on the gained knowledge from the explored literature review and empirical studies. Theoretically, the implementation of these tools should eliminate possible challenges and encourages creative active learning at the same time. The process of using the created tools, which were demonstrated in Question 2 discussion part, is explained for practitioners to follow with ease. Nonetheless, the developed mix-and-match tool has

been given the title “Museum Mashup” in the manual, which reflects the philosophy of the instructional design. Moreover, the process that took an entire thesis to be formed was compressed into four user-friendly steps, which are:

1. Know the lesson topic
2. Pair it with the relevant museum resource
3. Decide on the collaborative teaching method
4. Implement the designed lesson

Section 3 – This section involves lesson plans to showcase examples for teachers’ collaborative practices. In addition, section 3 includes tips and suggestions for teachers on alternative assessment methods that complements non-traditional teaching approaches. As was stated previously in Chapter 02, among the challenges teachers encounter when instructing using less traditional approaches was the assessment part. The shared tips could support teachers in performing all-inclusive lessons from preparation to assessment. Moreover, samples of the demonstrated lesson plan templet, the developed thematic strategy table, museum collaboration decision matrix, and partnership lifecycle were made available in this section.

Furthermore, regarding the manual dissemination, the manual is recommended first to be translated to Arabic and then published in a digital form. This decision was made to promote for a more sustained project. The manual could benefit from the advantages of the virtual world by excluding the time and space limitations, thus, schoolteachers can access the materials at their convenience. In addition, updates in museums’ programs and/or national schools’ curriculum could be integrated promptly eliminating the reprinting time, financial, and environmental costs. The manual was developed with

an aspiration to support effective instruction practices in government schools in Qatar through sustainable solutions.

Implications for Practice

The designed manual and the highlighted instructional design have different impacts on the project's stakeholders at different levels. The implementation of the study's content could advance the national education system position on the global landscape, support the country's vision, influence ministry's polices, complement school instruction practices, and help museums in Qatar to reach their full educational potential. The following segment demonstrate further elaborations and insights on the possible ways the results can be used by the mentioned fields.

Globally, implementing the manual featured practices and the partnership instructional design would highlight Qatar's educational and organizational initiatives worldwide. The implementation of the study findings will fulfil several SDGs making the nation aligned with the global vision. For example, Goal 4: Quality Education, the manual is an educational resource for schoolteachers that can be involved in their lifelong learning endeavours and career development. Besides, it would contribute to providing school students with access to a variety of learning experiences. Consequently, the museum-school collaborative work would influence partnerships within Qatar which Goal 17: Partnerships for the Goals emphasizes. Therefore, putting manual guide into practice stands as statement of contribution to SDGs.

At a national scale, as it was stated in previous chapters museum-school partnership would fulfil a patriotic obligation. The implementation of the suggested integration philosophy supports QNV 2030's Human Development Pillar by providing students with access to cultural institutions. The active engagement with

notions of educational collaboration and integration, would guarantee that every student had the opportunity to participate and benefit from the nation's valuable resources such as the museums. Moreover, the same national vision pillar encourages creativity and innovation in practices, which is a tenet of museum education. Collaboration with museums in addition to being QNV 2030 advocate, it could influence school culture, and MOEHE policies in Qatar.

On a ministerial level, the execution of the manual guidelines would be an embodiment of the authority's values, and impact its policies. The study's findings are aligned with the MOEHE embracement of novelty in the field of pedagogy. That is because developing and applying unorthodox methods are practices that can be accomplished through the utilization of museum resources intentionally and more often. Moreover, the designed manual aligns with the ministry's stated responsibilities of incorporating best practices and supporting government schoolteachers. Nonetheless, the thesis results could affect MOEHE policy making. Recognizing the significance of museum-school partnership and the inclusivity of the developed strategies could influence the development of policies that stimulate profound partnerships, hence, dynamic classroom instruction.

This thesis, especially the manual, can help teachers in Qatar's government schools in being resourceful with their instruction methods. The manual provides customized guidelines for the practitioners towards performing effective instruction in collaboration with museums. The provided information would contribute to teachers' knowledge about museums and their universal role in education. In addition, the featured strategies and procedures would give teachers the autonomy when designing their lessons and performing their instruction style. Museums' variety of resources such as field experts, collections, facilities, and more are all valuable resources that

could contextualize students' learning through real-world experiences. Besides, museums would benefit from frequent educational school requests and visits.

QM operating museums would reach their full potential when schools use their resources on a regular basis. The museums' educational function in the community as a preserver and exhibiter of subjects could be optimized through school partnerships. Moreover, just like schoolteachers, museum educators can use the manual and the featured strategies when developing learning materials and/or experiences for school groups. By following such approach, the offered programs effectiveness and alignment to the national curriculum would be substantial. For example, the mix-and-match strategy and identification of the weight of textbook included topic should be indicators for the designed workshops, activities, and materials if catering government school groups is the museum goal.

This study focused on the development of a manual that highlights museum integration philosophy. However, this is just a kick-off step of a project that holds the potential of transforming the educational scene in Qatar. The beginning could be through museums resources integration into classroom instruction method, but the goal should be normalizing the utilization of museums towards becoming national teaching-learning form. The partnership gap between formal and non-formal education systems in Qatar will eventually be minimized through actionable consideration of the next section's recommendations.

Recommendations

Based on the nature and scope of this study, several recommendations emerge that could impact different field aspects. The provided recommendations are supported by research and should contribute to the advancement of knowledge in the practices of museum-school collaborative works. This segment addresses the key

stakeholders of this research which are academia, Qatar Museums, government schools and MOEHE.

Academia - This study could be a resource for researchers with interest in conducting studies about the field of pedagogy, specifically on educational partnerships between formal and non-formal education systems. They can investigate different aspects related to classroom teaching-learning practices in collaboration with museums, such as students' knowledge retention and teachers' experiences, etc. Further details and suggestions can be found in the Future Research section of this chapter.

Qatar Museums - The organization includes state-of-the-art museums with themes and learning experiences that would enhance schools' lesson design in Qatar. However, based on the study's findings, QM entities could improve their educational offerings further towards programming inclusivity and services enhancement. The recommendations and suggestions for QM are as follows:

- Travelling exhibitions are effectives off-site educational programs which QM should consider offering. This will diversify the offers and give schools specially outside the city of Doha the chance to interact with the collections. In addition, complemented exhibitions' services such as learning activities should be offered with quality that parallels that entity as well as attracts teachers and students.
- Enhance the diversity and quantity of teaching-learning materials which teachers and students can use in the classroom. Tailored learning resources influenced by the national curriculum such as replica loan kits, educational

games, lesson plans, etc. should be available to support schoolteachers in their classroom instruction sessions.

- QM, as the museums authority in Qatar, is encouraged to offer workshops, courses, publications and learning materials for school personnel in topics linked to museum educational services.

Government Schools

- In-service teachers are the main agents in this collaboration, they must be supported in terms of utilizing museum resources through a variety of training channels and knowledge acquisition materials. Studies and publications are available on the subject matter that schoolteachers can explore and benefit from. In addition, customized training could be requested from QM when required.
- School students are highly recommended to have access to real-world learning experiences and other educational organization. Both aspects can be accomplished through using museums' offerings; however, schools should take the initiative and ensure that their students have these experiences included in the academic year agenda.

MOEHE

- A museum education course is suggested to be offered by College of Education in Qatar University for student teachers that focuses on integrating non-formal education services, specifically museums, in classroom practices. This would guarantee that the upcoming generation of teachers are well-equipped with the project.

- Despite the existence of initial collaboration initiatives between MOEHE and QM, there is a need for an official policy and procedures to be declared on a state level. The developed decree should standardize and guides formal and non-formal education institutions partnership practices.

Future Research

This present thesis aimed to develop a manual guide for government schoolteachers in Qatar to use the nations available resources in their instruction methods. Museums would be esteemed supporting agents to formal education system when well utilized. Moreover, due to the scale of the study, teachers view about the manual effectiveness and practicality is yet to be tested. Future research could be conducted on the application of the manual content. In addition, another recommended research could be about the impact of having a customized manual towards teachers' attitudes and willingness to utilize museum resources frequently. Conducting either research would contribute to the regional literature about teaching through collaboration with non-formal education institutions. Other suggestions for future research that are linked to the study:

- Conduct similar study by using a different learning theory such as Connectivism.
- Design a tool with practicality similar to Table of Specification to calculate the lesson weight in relation to the museum resource utilization duration. This would help teachers to make effective decisions.
- Empirical study on the impact of school-museum partnerships on students' performance.

- Develop a policy and procedures to execute school-museum partnerships on a national level.

Conclusion

The study's key questions are answered and the proposed manual is completed. This chapter underlined that there are varieties of styles and methods which promote museum-school collaboration. Their success is based on a well-planned integration and consideration of relevant factors that can contribute to integrating museum resources in classroom practices. There were few challenges reported in the form of time limitation or evaluation techniques; however, sustainable strategies were designed to emphasize the liberty in the bundle of choices. In addition, the practices go hand in hand with constructivism theory tenets of active and social learning which empowers the collaborative instructional design. It is fair to say, schools need museums to promote active and meaningful learning, likewise, museums need schools for their establishments and collections to be serving one of their ultimate purposes which is education. On other words, formal and non-formal education institutions complement each other, they are each other's ying and yang in the world of pedagogy. The study's proposed manual can be a contribution to supporting the nation, empowering educators, and creating meaningful learning experience for learners. This chapter concludes with an aspiration that it paved the path for a channel of communication between formal and non-formal education systems in Qatar.

The Study Conclusion

This final section concludes the main five chapters and present highlight glimpses of the conducted study. The thesis explored the multifaceted nature of integrating museum resources, shedding light on its universal significance. Classroom practices that are influenced by educational collaborations such as the ones between schools and museums enrich the education science with create and innovative experiences. Therefore, this thesis showcased such instructional philosophy and the possible ways it can be performed in Qatar. The three key research questions that directed the present thesis are:

1. What are the factors and practices of effective instruction in collaboration with museums?
2. What strategy can be used to integrate QM resources into government schools' instruction practices in Qatar considering constructivism philosophy?
3. What are the key components of a user manual to support effective instruction for government schoolteachers in Qatar through the utilization of museums' resources?

The aim of this study was to develop a manual guide that assists government schoolteachers in Qatar in their journey to promote museum-school partnership by using QM resources. Through literature review and analyzation of empirical studies, Qatar Museums content and the national education curriculum, the findings have shown that teacher's knowledge, museums offerings and execution strategies can foster innovative instruction, thus, were main components of the proposed manual.

The scope of this study shed the light on different topics that together framed the essence of the present thesis. It consolidates the factors of best practices from museum-school collaborations with implementation strategies to develop a manual about effective utilization of museum resources. The implementation of museum-school partnership principles can be found worldwide since antiquity that promote notions such object-based learning and real-world interactions as well active learning in classroom practices. With the increased demand on developing competence generations and innovation in teaching-learning, the extra urge comes to educational collaboration to support the formal education system. MOEHE and QM are substantial educational organizations in Qatar with unique ecosystems that together the proposed instructional design can be transformed from concept into practice.

The study was conducted through data collection and analysis which provided results that would influence effective educational integration. The Methodology and Results chapters focused on finding data that revolved around instruction practices through utilization of museums with a goal of developing a manual guide. Because each of the research questions explored a different side of the study topic, the research design included different methods which as Systematic Review, Document Research and Educational R&D. The diversity of approaches and findings from both chapters contributed to the interpretation of the practices and influenced practical implementation.

The first question was involved to acquire findings about teaching through utilization of museums from a world-wide view. The results overcame the expectations by addressing factors such as teachers' knowledge and practices' time allocation being key factors that impact the instructional design effectiveness. In addition, for the second question, the integration of museums in the lessons was affected by the lack of

literature. This fact was ideal as it influenced the utilization of primary resources manifested in museum galleries and national curriculum. As an initial step, it was crucial to find common elements between the two organizations, then recognizing the percent of correspondence between schools and museums through different techniques. Articulating question 1 and 2 findings resulted with the development of original partnership tools and lifecycle representation. Moreover, the third question followed the steps of Educational R&D in developing an educational product.

Nonetheless, a particular factor which is the amount of time required for the different utilization styles to be performed, impacted the results of the study. To have an effective collaborative lesson, it is recommended that the weight of a lesson in a textbook to be the balance or considered as an indicator that determines the suitable type of museum utilization. At first, someone would assume that the type of museum resource and complemented teaching-learning style would be the pillars of such utilization. However, the findings of this study state that comprehensive knowledge of available resources and calculated decision making are crucial players for effective instruction.

Furthermore, the significance of the present thesis can be found in terms of different related fields. For government schoolteachers, the manual's developed strategies and procedures come with the element of resilience. The manual does not challenge the national curriculum content or MOEHE educational philosophy. It is developed to be effective for teachers while complementing the formal organization ecosystem and mandate. Moreover, for museums, the dissemination and implementation of the manual could increase the number of schools that reach out to

the entities and their different fields experts. These actions help museums optimize the use of their facilities and other resources to fulfil their organizational goals.

Additionally, as a future action, the proposed manual has to be translated to Arabic and then to be field tested to determine its effectiveness and practicality. Evidence, specially based on experimental studies, can lead to the existence of a national policy that demonstrates the proposed integration philosophy as an imperative approach rather than an individual's choice. In addition, future research that is highly recommended is the development of a tool which measures the weight of a lesson in relation to museum resource utilization for better instruction decision making. Moreover, another study can be conducted on the same instructional design, however, focusing on different learning theories and philosophies. Accordingly, the literature gap in the field of educational partnerships would be minimized.

Learning through interaction with the real world is a concept which psychologists, theorist, researchers, teachers and students agreed to be effective and promotes meaningful learning. An instructional approach that champions the combination of outside world and classroom pedagogical practices is an approach that would influence competence generation. Working on museum-school partnership with clear vision, creative thinking and dedication would ensure knowledgeable and entertaining school lessons for both teachers and students. Moreover, a manual is developed to support such educational partnership; however, further research and actions are needed to foster collaborations between formal and non-formal education systems towards enriching the educational scene in Qatar.

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Appendices

Appendix A: List of Abbreviations

CLIL	Content and Language Integrated Learning
Educational (R&D)	Educational Research and Development
Mathaf	Mathaf: Arab Museum of Modern Art
MOEHE	Ministry of Education and Higher Education
MIA	Museum of Islamic Art
NMoQ	National Museum of Qatar
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
QM	Qatar Museums
QNV 2030	Qatar National Vision 2030
QOSM	3-2-1 Qatar Olympic & Sports Museum
SDGs	Sustainable Development Goals
UNESCO	United Nations of Education, Scientific and Cultural Organization
ZPD	Zone of Proximal Development

Appendix B: Question 1 Data Extraction Table Template

Code	Title	Resource					Activity				Museum Theme	School		Description	Factors	Result
		Publication Year	Type	Country	Language	Location	Frequency	Type				Subject	Grade			

Appendix C: Question 2 Qatar Museums Data Extraction Table

Category	MATHAF	MIA	NMoQ	QOSM
Museum Type				
No. of Galleries				
Main Galleries' Themes				
Featured Elements				
Learning Facilities				
Entry/Programs Costs				

Appendix D: Initial Prepared List of QM Galleries' Themes

#	Topics Related to QM Galleries' Content	Language Suitability		Topic Relevance		Alternative wording (if applicable)
		Suitable	Not Suitable	Relevant	Not Relevant	
1.	Archaeology					
2.	Architecture					
3.	Astronomy					
4.	Calligraphy					
5.	Ceremonial Practices					
6.	Citizenship					
7.	Climate					
8.	Colours					
9.	Ecosystems, Flora & Fauna					
10.	Foreign Affairs					
11.	Fossil Fuels					
12.	Geography					
13.	Geology of Qatar					
14.	Global Civilizations					
15.	Health					
16.	History of Islam					
17.	History of Qatar					
18.	History of Sports					
19.	Impact of Oil in Qatar					
20.	Islamic Civilizations & Culture					
21.	Islamic Faith					
22.	Language Proficiency (LLS)					
23.	Literature					
24.	Local & Global Events					
25.	Materials & Mediums					
26.	Mathematical Concepts					
27.	Modern Day Qatar					
28.	Mythologies					
29.	Planetology					
30.	Prominent Figures					
31.	Qatari Heritage & Culture					
32.	Sensory Experiences					
33.	Sports & Games					
34.	Sustainability					
35.	Technology					
36.	Tools and innovations					
37.	Trade					
38.	Traditional Medicine					
39.	Travel & Movement					
40.	Values and Ethics					
41.	Visual Art					
42.	Women in Society					
Are there any topics in the textbooks related to QM galleries' content you think should be analysed and evaluated? If yes, please specify below.						

Appendix E: Updated List & Textbooks' Data Extraction Table

QM Galleries Themes	Number of pages a theme occupies per-textbook					Total
	Arabic	Islamic	Math	Sciences	Social Studies	
Archaeology						
Architecture						
Artifacts						
Astronomy						
Attire						
Calligraphy						
Ceremonial Practices						
Chronology						
Citizenship						
Climate						
Colours						
Fossil Fuels						
Geography & Topography						
Geology						
Global Civilizations						
Health						
History of Islam						
History of Qatar						
History of Sports						
Impact of Oil in Qatar						
Influential Figures						
International Relations						
Islamic Civilizations & Culture						
Islamic Faith						
Language Proficiency (LLS)						
Literature						
Materials & Mediums						
Mathematical Concepts						
Modern Day Qatar						
Museums						
Mythologies						
Ecosystems, Flora & Fauna						
Qatari Heritage & Culture						
Sensory Experiences						
Sports & Games						
Sustainability						
Technology, Tools, & innovations						
Trade						
Traditional/Alternative Medicine						
Travel & Movement						
Values and Ethics						
Visual Art						
Women in Society						
Total						

Appendix F: List of the Explored Empirical Studies

Code No.	Study Title
1.	The Effectiveness of a Proposed Program Based on Museum Education in Developing Archaeological Awareness and National Sensibility Among Second Cycle Basic Education Students in the Sultanate of Oman.
2.	An Instructional Planning and Implementation of a Museum Tour Addressing Multiple Intelligences for First Graders
3.	Archaeological science at Flag Fen
4.	Conducting Museum Education Activities within the Context of Developing a Nature Culture in Primary School Students: MTA Natural History Museum Example
5.	Connecting Classroom and Museum Learning with Mobile Devices
6.	Creating Learning Experiences in Museums: Discussing - Inquiring - Participating My Museum - A participatory Interactive Exhibition
7.	Crossing Over Settings, Practices and Experiences: Connecting Learning in Museums and Classrooms
8.	Educational Games to Enhance Museum Visits for Schools
9.	Elementary Reflections: Case Study of a Collaborative Museum/School Curatorial Project
10.	Empowering Identity Through Art: Bilingual Co-Teaching at the Blanton Museum of Art
11.	Historic Forts: The Fort at No. 4 and Fort Ticonderoga
12.	History of Science and Science Museums: An Enriching Partnership for Elementary School Science
13.	Jamboree days
14.	Learning Beyond the Classroom: Students' Attitudes towards the Integration of CLIL and Museum-Based Pedagogies
15.	Living History Museums: Colonial Williamsburg, The Jamestown Settlement, Yorktown
16.	Local History Museums: The Minnesota History Center
17.	M+ Rover: Case Study for Participatory Art in Museum Learning
18.	Museum Education Between Digital Technologies and Unplugged Processes. Two Case Studies.
19.	Museum Education with Storyline Method: How Do Primary School Students Perceive Historical Artifacts?
20.	Museum education, cultural sustainability, and English language teaching in Spain
21.	Museum Trip to Enrich Environmental Awareness and Education
22.	Museums, Zoos, and Gardens: How Formal-Informal Partnerships Can Impact Urban Students' Performance in Science
23.	Stories from the Sea
24.	The Architect, the Museum and the School: Working Together to Incorporate Architecture and Built Environment Education into the Curriculum
25.	The Effect of Using Out-of-School Learning Environments in Science Teaching on Motivation for Learning Science
26.	The Flipped Museum: Leveraging Technology to Deepen Learning
27.	The Impact of a Museum Travelling Exhibition on Middle School Teachers and Students From Rural, Low-income Homes
28.	The School Teacher and the Art Museum: A Multi-Case Study of Online Canadian Art Museum Teacher Resources
29.	Traveling Exhibitions as Sites for Informal Learning: Assessing Different Strategies with Field Trips to Traveling Exhibitions at Non- Museum Sites
30.	Using Digital Natural History Collections in K-12 STEM Education
31.	Teaching History with Museums - Wadsworth Atheneum Museum of Art

Appendix G: Assistant 1 and Assistant 2 Collected Data Results

Assistant 1 Results

Textbook	Total Number of Pages	Numbers & percentages of pages the relevant themes occupy	
		#	%
Arabic	1794	524.4	29.23076923
Islamic	1618	377.7	23.34363412
Math	2445	368.45	15.06952965
Sciences	2462	646.5	26.25913891
Social Studies	1785	1163.5	65.18207283
Total	10104	3080.55	30.48842043

Assistant 2 Results

Textbook	Total Number of Pages	Numbers & percentages of pages the relevant themes occupy	
		#	%
Arabic	1794	508.5	28.34448161
Islamic	1618	364.2	22.5092707
Math	2445	347.05	14.19427403
Sciences	2462	624.4	25.36149472
Social Studies	1785	1079.1	60.45378151
Total	10104	2923.25	28.93161124

Appendix H: The Researcher's Textbooks Analysis Results

QM Galleries Themes	Number of pages a theme occupies per-textbook					Total
	Arabic	Islamic	Math	Sciences	Social Studies	
Archaeology	15.8	15.8			49.7	81.3
Architecture	31.6	68.3		0.25	3	103.15
Artifacts	63	25.6			19	107.6
Astronomy	52.45	0.65		0.5	2	55.6
Attire		3.5	6	131.25	7.8	148.55
Calligraphy	4.5		57.3	9.15	2.2	73.15
Ceremonial Practices	32.4			6.9	55.65	94.95
Chronology	17		2.7		4.3	24
Citizenship					1.2	1.2
Climate	70.15	27.35	130.25	202.1	101.8	531.65
Colours	13.75		0.35	0.75	43.9	58.75
Fossil Fuels	0.7	1.25		29.5		31.45
Geography & Topography	9.95		42.8	87.2	1.35	141.3
Geology	3.2	2.9	1.5	3.3	2.1	13
Global Civilizations	5.75		2.7	33.2	7.7	49.35
Health	0.2	3.25	20.9		5.05	29.4
History of Islam	0.55	3.2		4.2		7.95
History of Qatar	2.25	7.35	8.75	6.1	10.5	34.95
History of Sports	20.25	36.75		3.1	15.4	75.5
Impact of Oil in Qatar	5.6		7.05	0.45	0.65	13.75
Influential Figures	11.55	6.65			3.3	21.5
International Relations	502.2	353.85	338.6	612.6	1024.2	2831.45
Islamic Civilizations & Culture	15.8	15.8			49.7	81.3
Islamic Faith	31.6	68.3		0.25	3	103.15
Language Proficiency (LLS)	63	25.6			19	107.6
Literature	52.45	0.65		0.5	2	55.6
Materials & Mediums		3.5	6	131.25	7.8	148.55
Mathematical Concepts	4.5		57.3	9.15	2.2	73.15
Modern Day Qatar	32.4			6.9	55.65	94.95
Museums	17		2.7		4.3	24
Mythologies					1.2	1.2
Ecosystems, Flora & Fauna	70.15	27.35	130.25	202.1	101.8	531.65
Qatari Heritage & Culture	13.75		0.35	0.75	43.9	58.75
Sensory Experiences	0.7	1.25		29.5		31.45
Sports & Games	9.95		42.8	87.2	1.35	141.3
Sustainability	3.2	2.9	1.5	3.3	2.1	13
Technology, Tools, & innovations	5.75		2.7	33.2	7.7	49.35
Trade	0.2	3.25	20.9		5.05	29.4
Traditional/Alternative Medicine	0.55	3.2		4.2		7.95
Travel & Movement	2.25	7.35	8.75	6.1	10.5	34.95
Values and Ethics	20.25	36.75		3.1	15.4	75.5
Visual Art	5.6		7.05	0.45	0.65	13.75
Women in Society	11.55	6.65			3.3	21.5
Total	502.2	353.85	338.6	612.6	1024.2	2831.45

Appendix I: Assistant 1 Textbooks Analysis Results

QM Galleries Themes	Number of pages a theme occupies per-textbook					Total
	Arabic	Islamic	Math	Sciences	Social Studies	
Archaeology	0.7	1.1	1.15		45.2	48.15
Architecture	5.6	0.85	15.2	2.2	14.2	38.05
Artifacts		0.15			19.25	19.4
Astronomy	1.9	14.2	5.65	3.6	11.1	36.45
Attire	6.8	3.75	5.6	7.2	10.5	33.85
Calligraphy	26.2	2			0.8	29
Ceremonial Practices		0.2			5.45	5.65
Chronology	0.95		0.2	1.25	18.1	20.5
Citizenship	21.6	17.15		0.15	79.3	118.2
Climate	6.2	2.8	8.1	15.35	87.95	120.4
Colours	13	9.95	7.8	8.2	1.25	40.2
Fossil Fuels			7.6	6.9	2.8	17.3
Geography & Topography	12.8	12.1	10.9	8.2	278.8	322.8
Geology			1.85	4.65	28.1	34.6
Global Civilizations	4.3	0.2	2.6	2.1	82	91.2
Health	6.9	4.65		36.45	1.2	49.2
History of Islam	6.8	60.35			0.9	68.05
History of Qatar	1.8				51.2	53
History of Sports						0
Impact of Oil in Qatar	0.2					0.2
Influential Figures	31.3	22.4	3.1	13.5	28.1	98.4
International Relations	2.4	5.85			24.1	32.35
Islamic Civilizations & Culture	15.8	16.45			52.4	84.65
Islamic Faith	33.2	69.1			3.2	105.5
Language Proficiency (LLS)	67	25.2			23.7	115.9
Literature	52.7	0.75			1.7	55.15
Materials & Mediums	1	3.9	6.75	136.25	9.1	157
Mathematical Concepts	5.75	8.95	64.15	11.2	2.4	92.45
Modern Day Qatar	32.4			7.1	61.05	100.55
Museums	15.9		2.8		5.25	23.95
Mythologies						0
Ecosystems, Flora & Fauna	74.1	30	135.4	206.5	107.95	553.95
Qatari Heritage & Culture	13.95		0.1	0.25	45.35	59.65
Sensory Experiences	1.7	1		33.15		35.85
Sports & Games	8.85		45.55	91.1	3	148.5
Sustainability	3.1	2.1	1.5	2.95	2.9	12.55
Technology, Tools, & innovations	6.4	0.8	2.3	35.1	12.35	56.95
Trade	0.1	4.55	23.2	0.15	6.3	34.3
Traditional/Alternative Medicine	0.5	6.75		3.2		10.45
Travel & Movement	1.75	8.8	9.4	7.65	12.75	40.35
Values and Ethics	24.85	34.5		1.95	15.9	77.2
Visual Art	3.8		7.55	0.2	4	15.55
Women in Society	12.1	7.15			3.9	23.15
Total	524.4	377.7	368.45	646.5	1163.5	3080.55

Appendix J: Assistant 2 Textbooks Analysis Results

QM Galleries Themes	Number of pages a theme occupies per-textbook					Total
	Arabic	Islamic	Math	Sciences	Social Studies	
Archaeology	0.95	1.2	1.35		44.1	47.6
Architecture	5.3		13.1	1.8	13.9	34.1
Artifacts		0.3			19.2	19.5
Astronomy	2.2	14.9	5.2	3.45	10.7	36.45
Attire	6.3	4.75	5.8	6.7	7.9	31.45
Calligraphy	24				1	25
Ceremonial Practices					5.2	5.2
Chronology	1.25		0.2	1.2	16.6	19.25
Citizenship	18.4	17.2			39.95	75.55
Climate	5.5	3.35	7.9	13.95	88.05	118.75
Colours	11	8.55	7.3	7.85	1.75	36.45
Fossil Fuels			1.2	7.7	2.4	11.3
Geography & Topography	12.5	10.2	10.4	7.35	275.4	315.85
Geology			2	4.3	23.2	29.5
Global Civilizations	4.5		2.45	1.2	79.3	87.45
Health	7.45	5.1		34.3	0.9	47.75
History of Islam	6.2	59.8				66
History of Qatar	6.3				49.15	55.45
History of Sports						0
Impact of Oil in Qatar						0
Influential Figures	31.2	20.8	2.9	11	26.1	92
International Relations	2.6	6.45			23.65	32.7
Islamic Civilizations & Culture	15.9	16.1			52.1	84.1
Islamic Faith	31.8	68.2		0.5	2.7	103.2
Language Proficiency (LLS)	64.35	24.9			20.1	109.35
Literature	51.65	0.5			1.3	53.45
Materials & Mediums	0.15	4.1	6.6	133.25	8.2	152.3
Mathematical Concepts	5.2	2.7	60.1	10.45	2.65	81.1
Modern Day Qatar	31.6			6.4	57.1	95.1
Museums	16.7		2.15		4.45	23.3
Mythologies					2	2
Ecosystems, Flora & Fauna	71.3	28.2	132.15	203.05	104.2	538.9
Qatari Heritage & Culture	14.35		0.2	0.65	44.5	59.7
Sensory Experiences	1	0.85		29.95		31.8
Sports & Games	9.15		43.4	88		140.55
Sustainability	2.9	3.2	1.5	3.15	2.8	13.55
Technology, Tools, & innovations	6.25		2.8	34.65	8.2	51.9
Trade		4.85	22.25		5.9	33
Traditional/Alternative Medicine	0.7	7		3.3		11
Travel & Movement	1.4	8.2	8.9	7.1	11.3	36.9
Values and Ethics	22.25	36		2.9	15.2	76.35
Visual Art	4.25		7.2	0.25	3.25	14.95
Women in Society	11.95	6.8			4.7	23.45
Total	508.5	364.2	347.05	624.4	1079.1	2923.25

Appendix K: Mix-and-Match Sheet

National Curriculum Themes
Archaeology
Architecture
Artifacts
Astronomy
Calligraphy
Ceremonial Practices
Citizenship
Climate
Ecosystems, Flora & Fauna
Fossil Fuels
Geography & Topography
Geology
Global Civilizations
Health
History of Islam
History of Qatar
Influential Figures
International Relations
Islamic Civilizations & Culture
Islamic Faith
Literature
Modern Day Qatar
Museums
Qatari Heritage & Culture
Sports & Games
Trade
Traditional Medicine
Travel & Movement
Values and Ethics
Visual Art
Women in Society
Skills and General Concepts
Chronology
Colours
Language Proficiency (LLS)
Materials & Mediums
Mathematical Concepts
Sensory Experiences
Sustainability
Technology, Tools, and innovations

QM Galleries' Major Themes		
MIA	**Mathaf**	
Architecture	Arab Art	
Artifacts	Ceremonial Practices	
Astronomy	Culture	
Calligraphy	Global Civilizations (Arab)	
Ceremonial Practices	History of Arab	
Ecosystems, Flora & Fauna	Influential Figures	
Geography	Literature	
History of Islam	Museums	
Influential Figures	Travel & Movement	
International Relations	Women in Society	
Islamic Art, Civilization and Culture	**NMoQ**	
Islamic Faith	Archaeology	
Physical Science	Architecture	
Literature	Artifacts	
Museums	Astronomy	
Mythologies	Calligraphy	
Trade	Ceremonial Practices	
Traditional Medicine	Citizenship	
Travel & Movement	Climate	
Values & Ethics	Culture & Heritage (Qatari)	
Visual Art	Customs & Traditions	
QOSM	Ecosystems, Flora & Fauna	
Astronomy	Fossil Fuels and Energy	
Climate (Seasonal Games)	Geography & Topography	
Culture	Geology	
Ecosystems, Flora & Fauna	Heritage	
Geography & Topography	History of Qatar	
Global Civilizations	Influential Figures	
Health & Well-being	International Relations	
History of Sports (Globally & Qatar)	Modern Day Qatar	
Influential Figures	Natural Environment	
Modern Day Qatar	Museums	
Museums	Mythologies	
Mythologies	Trade	
Sports & Games	Traditional Medicine	
Travel & Movement	Travel & Movement	
Values & Ethics	Women in Society	
Visual Art		
Women in Society		

Museums' Experiences Use the Decision Matrix	
On-site (ex: Field Visit)	
Traditional Tour	
Interactive Tour	
Workshop	
Hands-On Activity	
Off-site (ex: Classroom)	
Museum Outreach (collections/experts)	
Live Virtual Sessions	
Online Materials	
Combination of Sites	
Collaborative Project	

Constructivism Theory Supported Methods
Cooperative Learning
Discussions
Experimentations
Flipped Classroom
Game-based Learning
Inquiry-based Learning
Project-based Learning
Other