Using the Multiple Intelligences Theory to Compare Student Learning Styles with Classroom Curriculum Opportunities

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to Compare Student Learning Styles with
Classroom Curriculum Opportunities

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MA thesis in International Studies in Education
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Preface

This research, *Using the Multiple Intelligences Theory to Compare Student Learning Styles with Classroom Curriculum Opportunities*, has been written to fulfill the graduation requirements for an M.A. in International Studies in Education at the University of Iceland. I conducted research and wrote this work from November 2015 to July 2016.

This idea stems from an introductory pedogogy class from my B.A. program in Early Childhood Education at the University of Alaska Anchorage in 2009. That introduction led me to read Howard Gardner’s *Frames of Mind* for the first time, and ponder the question of every pedagogist: How do people learn? This work will not answer that question, but explores how MI theory can be used to compare student learning with classroom and national curriculum.

For their mentoring and assistance on this project, I would first like to thank Ólafur Páll Jónsson for advising me from the beginning to the end of this work, and to Erla Kristjánsdóttir for sharing her knowledge of MI theory and education in Iceland. Thanks also go out to Susan Gollifer as the first person to help me develop my research proposal, and Auður Pálzdóttir for offering advice and keeping me on track.

I would also like to express my appreciation to my parents, for their expectation of education and explaining to my six year old self that I would one day go to university, and to my sister, a worthy adversary and confidant in all things. Thank you also to Jodie, María, and Nikki for your support and problem solving over the last 8 months.

I hope you find this work interesting and relevant to the course of education.

Sydney Ross Singer
Reykjavík, August 30th 2016.
Abstract

This 40 credit M.A. research thesis uses Howard Gardner’s Multiple Intelligences (MI) Theory as an analytical tool for comparing student learning inclinations against classroom practices and guidelines from the Icelandic National Curriculum. This is a mixed methods case study of one grade-school classroom. Data collection methods include: an Icelandic MI survey administered to case study students, observation and documentation related to MI in teaching and lesson formats, observation of teaching methods and classroom practices, and interviews of the classroom teacher and school Principal on teaching methods and interpretation of Iceland’s curriculum. Data is analyzed using Gardner’s eight intelligences (linguistic, musical, logical-mathematical, visual-spatial, bodily-kinesthetic, naturalistic, interpersonal, intrapersonal), as a framework to compare the specific kinds of classroom practices observed, and frequency and importance of MI activities and instruction in written texts and interview responses.

A comparison between student’s MI inclinations, and perceived classroom methodology and curriculum gives greater insights into how well Iceland’s educational goals and classroom practices reflect the way students learn. This includes how the curriculum adapts, or fails to adapt, to the learning needs of individual students in the classroom. Iceland’s new Pillars of Education focus on students utilizing their strengths, a balance between academic and practical education, and Learnability (a student’s knowledge of their own strengths and weaknesses). This study collected additional information on how these outcomes translate into student learning in the classroom, and discusses the strengths and weaknesses of the case study classroom’s approach.
Í þessari fjöruni eininga M.A. rannsóknarritgerð er Multiple Intelligences (MI) kenning Howard Gardner notuð sem greiningartöl til að bera námshøgðun nemenda saman við aðferðir innan kennisstofa og viðmið íslenskrar aðalnámsskrár. Þessi vettvangsrannsókn var framkvæmd með ýmsum aðferðum í einni grunnskólakennisstofu.

Gagnasöfnun för meðal annars fram sem íslensk MI könnun lögð fyrir vettvangsnemendur, athugun á kennisluleiðum og kennislstofuaðferðum og viðtöl við kennara og skólastjóra vettvangsins um kennslaðferðir og tulkun á aðalnámsskrá. Gögnin eru greind samkvæmt MI-kenningu Gardner um átta greindersvið (tungumálarein, tónlistargreind, rökfræði-stærðfræðigreind, sjó- og rýmisgreind, likams- og hreyfigreind, náttúrugreind, samklistargreind, sjálfspekingargreind ) og hún notuð sem umgjörð til að bera saman þær ákveðnu tegundir kennislusiðferða sem aðhugaðar voru og tíðni og vægi fjölgreindaverkefna og leiðbeininga í ritu máli og viðtöllum.

Samanburður á MI-greind nemenda og skynjaðri aðferðafræði á kennisstofu og námsskrá gefur frekari innsýn í hversu vel menntunarmerkið Íslands og kennsluaðferðir spegla lærdomsaðferðir nemenda. Farið verður yfir hvernig námsskrá fellur að, eða fellur ekki að, þóðum hvers nemanda innan kennslustofunnar. Með grunnþáttum menntunarnar, í Aðalnámsskrá grunnskóla er lögð áhersla á að nemendur nýti sér styrkleika sína, á jafnvægi milli fræðilegjar og hagnýtar menntunarnar og á námshæfni (þekkingu nemanda á eigin styrkleikum og veikleikum). Í þessari ritgerð er safnað saman viðbótarupplýsingum um hvernig þetta hefur áhrif á lærðum nemenda innan kennslustofunnar og rætt um styrkleika og veikleika í nálgun í kennslustofunni sem rannsókuð var.
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1 Introduction

This is a 40 credit M.A. research thesis using Howard Gardner’s Multiple Intelligences (MI) Theory as an analytical tool for comparing student learning inclinations against classroom practices and guidelines from the national curriculum. This is a mixed methods case study of one Icelandic grade-school classroom. Data collection methods include: an Icelandic MI survey administered to case study students, observation and documentation related to MI in teaching and lesson formats, observation of teaching methods and classroom practices, and interviews of the classroom teacher and school Principal on teaching methods and interpretation of Iceland’s curriculum. Data is analyzed using Gardner’s eight intelligences (linguistic, musical, logical-mathematical, visual-spatial, bodily-kinesthetic, naturalistic, interpersonal, intrapersonal), as a framework to compare frequency and duration of specific kinds of observed classroom practices, and frequency and importance of MI activities and instruction in written texts and interview responses.

A comparison between student’s MI inclinations, and perceived classroom methodology and curriculum, gives greater insights into how well Iceland’s educational goals and classroom practices reflect the way students learn. This includes how sensitive the curriculum is to the learning needs of individual students in to the classroom. Iceland’s new Pillars of Education, focus on students utilizing their strengths, a balance between academic and practical education, and Learnability (a student’s knowledge of their own strengths and weaknesses). This study seeks additional information on how well these outcomes translate into how students actually learn in the classroom.

1.1 Rationale

1.1.1 Gardner’s Perception of Learning and Intelligence

Schools based in Western ideals of education, what Gardner calls the implicitly and explicitly learned ideals on classical views of intelligence based on rationality and literacy, overwhelmingly focus methods of instruction, evaluation, and curriculum goals and standards solely within the context of literacy (1985). Students spend the majority of their time in direct instruction, reading, and writing, to the exclusion of other teaching
and learning methods. Gardner (1985) argues that this is because traditional views of intelligence prevail, harking back to the time of the ancient Greeks, namely the ideals of the perfect mind, rationality and intelligence.

And yet, intelligence is an abstract concept. If intelligence is measured as it is most often tested, primarily in terms of the ability to solve equations, or read and write well, literacy is in fact being measured, and we know one need not be literate to be intelligent. Gardner proposed his 8 MI as a model that opposes this traditional view of literacy and logic as intelligence, asserting that such a limited view of human ability does not accurately represent the capacity of the human mind. Gardner views intelligence not as a set measure of ability, but instead as the development of intellectual competences (1985). Competences, or personal skill set, are what enable an individual to “resolve genuine problems or difficulties that he or she encounters and, when appropriate, to create an effective product...” (1985). Thus the eight intelligences proposed by Gardner are indeed intelligences, defined as the way people take in new knowledge, and their capacity to re-represent that knowledge.

This argument, that learning and intelligence are not solely within the domain of literacy practices, leaves an obvious hole in our curriculum and methodology. I do not assert that Gardner’s MI are the eight ways that all people intake, process, and express intelligence. I argue that Gardner’s MI are an applicable, non-traditional view of intelligence and are both concrete and measurable. Data gathered on student skill and preferences within the framework of MI can be effectively compared to corresponding themes or concepts in curriculum, and it is this overlap in students learning inclinations and experienced curriculum that affords us opportunities for greater insight into current education practices.

It has also been argued that using MI to direct children and individualize curriculum is a natural and logical step to correct undesirable behaviors that interfere with student learning (Armstrong, 1994). Students do not wait to be introduced to MI theory before participating in it, and it is a system that can classify already existing behaviors. A student with high interpersonal and/or linguistic intelligence will talk in class, participate in group activities, or distract other students during instruction. A teacher or researcher can observe student’s behaviors and collect data based on what they see (Armstrong, 2009), because in this context MI simply classifies what is already present. This data can then be used to better meet the classroom and learning needs of students.
1.1.2 Iceland’s Pillars of Education

Iceland’s national curriculum has an emphasis on the learning process, and the rights of students. The six Pillars (Literacy, Sustainability, Health and Welfare, Democracy and Human Rights, Equality, and Creativity) focus on students as a whole. These six goals are described as fundamental, and “an intrinsic part of all curriculum guides at all school levels” (Ministry of Education, Science and Culture, 2012). As an example, this means that democracy and human rights are not just a subject to be learned about, but should be actively practiced in the classroom. Classroom materials and activities, school practices, and teaching methodology should all further the Pillars, incorporating concepts of citizenship and responsibility, democratic processes, and fostering understanding and acceptance within the community. This is especially evident in the stipulations for school activities, as “Procedures of teachers and other school personnel are to … encourage independence, initiative and development of school activities” (Ministry of Education, Science and Culture, 2012).

Additionally, the Ministry of Education, Science and Culture defines knowledge, skill, and competence, first, as an accumulation of facts, then finally as the ability to utilize intellectual and practical knowledge and skills. This closely mirrors Gardner’s definition of learning competences, where mastery is described as the ability to solve problems using learned skills.

Many aspects of Iceland’s National Compulsory Education Curriculum have the same goals and desired outcomes as Howard Gardner’s MI theory, including promoting student skills and interests, and an education system that promotes the self through autonomy. Iceland’s Pillars describe the role of the teacher as someone who imparts knowledge to pupils, while “…giving them an opportunity to acquire knowledge and skills, encouraging their joy of working and nurturing creative thinking” (Ministry of Education, Science and Culture, 2012). This is very similar to Gardner’s views on education, that students should be given the opportunity to learn in different ways, and build upon their strengths. Due to these similarities, the National Curriculum of Iceland can effectively be categorized in terms of MI theory. For example, if we assess the Democracy and Human Rights Pillar within the contest of MI, it places heavy emphasis on Intrapersonal, Interpersonal, and Logical-Mathematical skills. Students need to understand and actively practice democracy in the classroom, including managing their own behavior and asserting their own needs (Intrapersonal), develop and uphold human value and health within the context of school and greater community, and practice those values within
the classroom and at home (Interpersonal), and develop and practice critical thinking and reflection skills about themselves, their own education, and their society (Logical-Mathematical). It is this commonality within the values and practices of Iceland’s curriculum and MI theory that makes the two comparable, and MI a useful tool to compare national curriculum to classroom practices and student learning.

1.1.2.1 Literacy

The National Curriculum has a strong emphasis on Icelandic language skills as the gateway to strong social skills, student’s ability to develop into a citizen of a democracy, critical thinking skills, cultural heritage, and overall literacy. Icelandic language is broken into 4 categories for competence, 1) spoken language, listening, and interpreting pictures, 2) reading and literature, 3) writing, and 4) grammar. With the exception of gaining information from pictures, which could be considered a visual-spatial skill, these are all activities that develop literacy and social skills. The guide for evaluating student’s competence in Icelandic language and literature incorporates more skills, including intrapersonal (identity and self expression), bodily-kinesthetic (pronunciation, legible writing), musical (interest in a recital or music, poetry), and logical mathematical (decoding, symbols, maps, graphs). Icelandic is supposed to be taught in an integrated, relevant way that encourages students to develop their own skills, and later use Icelandic for continued, lifelong learning.

1.1.2.2 Democracy and Citizenship

Education for democracy and citizenship is a very prevalent theme of the national curriculum. It determines that one of the main purposes of education is to develop life skills for becoming a productive citizen that can fully participate in the democratic process. This development can take a variety of forms, but focus on literacy and critical thinking skills so that students can obtain information, critically analyze it, form their own opinions, and make decisions based on their findings.

1.2 Significance of the Project

The significance of this project lies primarily within our ability to use collected data in an analysis of current teaching practices. Teaching effectively means knowing and adapting to student learning. According to the Ministry of Education, Science and Culture’s National curriculum Guidelines for 2013 (2012) “extensive changes have taken place in Icelandic
society and these have both direct and indirect influence on the educational system, the pupils’ studies and the work of teachers”. Teachers are faced with new challenges, including analyzing social changes and adapting school practices to meet the needs of Iceland’s students.

Additionally, Iceland’s Pillars of Education and new educational policies have goals for teaching and learning. This includes taught subjects and methods of teaching, as well as school dynamic and the desired outcome of a complete education. This research provides data on how those policies are represented in the classroom.

1.3 Research Questions

This study seeks information on how the Icelandic National Compulsory Curriculum relates to the learning processes and choices of students in their classroom, and how well that classroom experience reflects the way students learn. This can be compared by through the categorization of school practices and student behavior outlined in sections 3 and 4 on Methodology and Results. For the purposes of this research, I am working with Armstrong’s definition of a learning style, or learning inclination, as the utilization of a specific skill or skillset when problem solving or learning. Knowledge is acquired more quickly and thoroughly when using preferred methods (Armstrong, 2009).

For the purposes of this research, curriculum is considered very broadly as the amalgamation of national goals and guidelines, school policy and charter, and classroom practices, both in terms of environment and teaching methodology. It is a sum of these that students experience, and thus the focus of this study.

Multiple intelligences are defined in the Literature Review of this document as the 8 MI developed by Howard Gardner: linguistic, musical, logical-mathematical, visual-spatial, bodily-kinesthetic, interpersonal, intrapersonal, and naturalistic. It is not the purpose of this study to prove the validity of Gardner’s MI theory, but to use his and Thomas Armstrong’s categorizations of intelligences as a framework for comparison and analysis between ideology and concrete experience.

With this focus on student experience of curriculum, the proposed research seeks to answer three interrelated questions that gather and compare student MI responses to curriculum. These questions are:

1) With which Multiple Intelligences do the case study students most strongly align?
2) What Multiple Intelligences are evident in the case study classroom practices, and to what extent?

3) How do these MI of the case study classroom compare with Iceland’s curriculum goals?

Curriculum, classroom practices, and student learning styles all contribute to how students experience education in the classroom. These are three related factors of education that must be considered together, but are very different. Comparing written curriculum to how students learn, and ongoing classroom practices, presents innate challenges on how to assess such different factors. In an effort to effectively compare these three aspects of compulsory education, MI theory is used as a consistent framework for this comparison.
2 Literature Review

This study supports Iceland’s goals for national compulsory education. Research has already been conducted about Iceland’s schooling practices, leading to the declaration of the six Educational Pillars from the Ministry of Education, Science and Culture: Literacy, Sustainability, Health and Welfare, Democracy and Human Rights, Equality, and Creativity (2012). This research project found additional information on how curriculum supports student learning, within the framework of MI.

2.1 The Multiple Intelligences

Gardner developed the Multiple Intelligences as an alternative theory to traditional understandings of intelligence and IQ testing. Assuming that assessing an individual’s intellectual potential is complicated, and that areas of expertise or skill will be valued differently based on their societal and cultural context, Gardner proposes that an IQ exam does not adequately assess an individual (1985). Additionally, teaching to mastery of traditional testing methods does not account for different skillsets and inclinations.

Though there are conflicting ideas of what intelligence and learning style are, this work uses Gardner’s definitions throughout the literature review and study, as well as Armstron’s similar definition of ‘style’. With this in mind, it is particularly important to clarify the term ‘learning style’. Gardner applies the term style as the way that someone chooses to approach a task. This is different from an intelligence, described as the capacity of an individual to carry out that task (Gardner, 2011). Though closely related, the difference is strategy vs. capacity. This study does not measure capacity for learning, but instead uses observable learning strategies as a tool to gain insight how students choose to learn. In this way the terms are related, but not the same.

For the purposes of this research, I will be working with eight of Howard Gardner’s MI, with definitions from both Gardner and Thomas Armstrong, who focused on using MI theory to facilitate student’s learning in a classroom context.

Linguistic intelligence is skill and interest surrounding words, syntax, phonology, grammar, and can be found within the context of both written and spoken language. Gardner uses the example of the poet T.S. Elliot to
describe someone with strong linguistic intelligence. Gardner considers Elliot both an expert on poetry and written word, and someone who has “special clarity (on) the core operations of language” (1985). A person with little interest or skill in writing can be persuasive, but are far less likely to agonize over the word choices and placement that form complex poetic rhythms. Some people, like Elliot, are innately skilled at using words to communicate. These aspects of language, and the activities that allow us to practice them, are called linguistic intelligence.

Musical intelligence is skill and interest in the formal and informal aspects of music. Someone who excels at the formal aspects of music may have a strong understanding of music theory or rhythm, and accurately predict musical patterns. Thomas Armstrong discusses what informal aspects of this intelligence might look like in an education context, including accurate pitch, performance, and knowing the feeling of a musical piece; these are better examples of musical expression and discrimination (Armstrong, 2009). In a theoretical and developmental context, Gardner describes musical intelligence as one of the first of the 8 MI to emerge in young children. It is also the most varied MI in terms of development, and Gardner describes the difference within musical intelligence with the example of three pre-school children who have early musical talent. One child plays the violin with both accuracy and feeling, the second sings a complete aria after hearing it only once, and the third plays a self-composed minuet on the piano (Gardner, 1985). They would all be considered exceedingly talented, though their skills are quite different. Some people will be very skilled in, or appreciative of music, and others have cannot hear the difference between the sounds or notes of an instrument; this is what defines musical intelligence.

Logical-Mathematical intelligence is defined by Armstrong as “the capacity to use numbers effectively...and reason well” (2009). Much like musical intelligence, skill in logical-mathematical concepts is often dominated by the ability to recognize patterns and relationships, in this case between numbers. This develops into strong abstract thinking skills that may or may not revolve around numbers; these skills include prediction, inference, calculations, approximations, classification, generalization and hypothesis testing (Armstrong, 2000). This idea of the development of abstract thought shared in part by Piaget, who classified the stages of logical thinking children develop, from understanding the relationships/function between people and objects, to higher order thinking, allowing us complex, abstract thoughts without the benefit of concrete objects or situations (Gardner, 1985). This forte in recognizing and
creating organization, categorization, and patterns is what defines logical-mathematical intelligence.

**Visual-Spatial intelligence** is the capacity to accurately understand and mentally navigate the surrounding world. This ‘navigation’ can occur in several ways, including a sense of direction, the ability to match/complement patterns, shapes, or colors, and accurately recalling physical objects and spaces in a different context or medium. Gardner uses the example of traditional intelligence testing as an example of this intelligence. A puzzle that asks the recipient to find an identical visual pattern match from a selection, or of a drawing rotated or mirrored, is testing visual-spatial intelligence (1985). Concrete examples of people using visual-spatial intelligence include someone who is seldom lost (they can mentally orient themselves even in a new context), an architect who can draw a space based on measurements and/or recollection, and an artist who paints a portrait of a physical object. This ability to accurately recall or reproduce something seen or experienced, is core to visual-spatial intelligence.

**Bodily-Kinesthetic intelligence** is a deep understanding of what one can craft, communicate, or alter using the hands and body. This includes acts of athleticism and physicality including balance, woodworking, and spearfishing, as well as what Armstrong calls “expressions of ideas and feelings”, such as dance or acting (2009). Much like visual-spatial intelligence, people with strong bodily-kinesthetic affinity are able to re-represent, or recreate an idea or object in a new medium, or fix something that was broken. Gardner breaks this down further, describing three separate categories of physicality; these are mastery of motion (dancers, swimmer), mastery of tools (painter, instrumentalist), and those “in whom use of the body proves central” (inventors, actors) (1985). The categorization is slightly different between theorists, but the core of this idea remains the same; the ability to skillfully craft or communicate using one’s physicality is what defines bodily-kinesthetic intelligence.

**Interpersonal intelligence** is the ability to both make sense of and distinguish between the moods, motivations, and intentions of others, and “effectively respond” (Armstrong, 2009). Interpersonal intelligence is social; it means understanding why people act the way they do, and seeing or creating patterns on social situations. People with this intelligence use their understanding of facial cues, gestures, and patterns of behavior to influence those around them, and work more effectively in teams and social settings. Humans all have social capacities and needs, but it is skillful
interpretation and action within such contexts that define interpersonal intelligence.

**Intrapersonal intelligence** is a deep sense of self, and the ability to self-regulate. In direct contrast to interpersonal intelligence, the sense of self is a complex combination of emotions, motivations, wants, esteem, and many other factors such as perceived abilities and social relationships, within the mind of a single individual. It is a skill to be able to recognize, analyze, and adapt one's sense of self, regulating feelings and desires productively. Armstrong argues that it is this productive adaptation, specifically regarding one's perception of themselves, which defines intrapersonal intelligence (2009).

**Naturalistic intelligence** was added later Gardner's list of intelligences, and relates specifically to skill and interest in nature and the natural world. Individuals with strong naturalistic intelligence are inclined towards outdoor professions and hobbies, and understand the process of the natural world well, including direction, storm warnings, tides and seasons, or tracking. Additionally, this may manifest as an interest in the products of the natural world, including a desire to have or work with natural light, natural materials, or have strong relationships with animals (1985). Gardner added this 8th classification because is this understanding of nature and the natural world which set naturalistic intelligence apart.

### 2.2 Multiple Intelligences in the Classroom

As previously mentioned in the rationale section, MI is well suited to use in a classroom context. Armstrong sums this up concisely as highly developed intelligences represented through misbehavior. Students with strong kinesthetic intelligence will, in all likelihood, be highly motivated and participatory in physical activities, recess, and gym classes. They are also quite likely to display ‘undesirable’ observable behaviors, including fidgeting, an inability to concentrate while sitting still, and a marked dislike of long quiet and still activities. Armstrong imagines that children with strong kinesthetic intelligence are demonstrating: “This is how I learn, teacher, and if you don’t teach me through my most natural learning channels, guess what? I’m going to do it anyway.” (Armstrong, 1994)

In this way MI is also suited to evaluate curriculum, but Gardner and Armstrong separate on how such evaluation can be accomplished. If students can be observed engaging in their intelligences, curriculum can be assessed based on the opportunities it presents for utilizing said
intelligences. Within this context, MI is well suited as an alternative or remedy for one-sided teaching (Armstrong, 1985), and can clearly demonstrate the needs of classroom learners. Nearly 70% of time in an average classroom is spent on ‘teacher talk’, where teachers use direct instruction and lecture (Goodlad, 1980). This might be a good curriculum match for strongly linguistic and interpersonal students who enjoy listening and understand how to manage their own time and distractions, but the chances of having a full class of such students seems nearly impossible. MI theory is a practical and measurable way of comparing how students learn, to the opportunities their curriculum presents them with.

Armstrong uses the afore mentioned eight MI as a guideline for identifying how students prefer to learn. This is based how children think, what they love to do, and what they need to learn as further described in Table 1: Armstrong’s Eight Ways of Learning. Each intelligence is a way students can take information, and curriculum can provide learning opportunities. This is a departure from what Gardner developed to construct MI rich curriculum, the Entry Points Framework. This is a six category system that uses MI to discuss aspects of curriculum as follows:

- Narrative: Stories central to the topic. Accounts, retelling, enacting.
- Logical-Quantitative: Logical reasoning and the numbers involved in the topic. Scenarios and critical thinking.
- Experiential: Hands-on and the physical aspects of a topic. Building, experimenting, and documenting experiences.
- Interpersonal: Cooperation to learn about a topic. Group activities, partners, and socially dependent tasks.
- Existential/Foundational: Philosophical background and questions about the topic. Meaning, purpose, and function.

(Kornhaber, Fierros and Veenema, 2004)

This representation of MI theory focuses specifically on curriculum, and Gardner asserts that this may be an easier and more applicable form of diversifying teaching methods and curriculum than the original intelligence centered MI theory. While Gardner and Armstrong diverge on how MI theory can be used to assess or develop curriculum, they both agree that curriculum rich in MI leads to better learning.
2.3 The Controversy of MI Theory

MI theory is just that, a theory. It is not a universally accepted standard for learning, intelligence, or teaching methods, and this work does not argue that it is. This work was constructed with the idea that intelligence and the way that people learn is complex and individual, and that limited teaching methods lead to limited opportunities for learning. In turn, rich and varied methods of teaching lead to greater opportunities for learning.

Critics of MI theory argue that Gardner’s definition of intelligence is incorrect, and confuses talent with intelligence (White, 2008). This is an issue of perception and how one understands intelligence and learning, as addressed in section 1.1.1, Gardner’s Perception of Learning and Intelligence. Traditional views of intelligence, based on IQ tests, school performance, deductive reasoning, or test scores, are in direct conflict with Gardner’s view, that intelligence is the development of existing intellectual competences. Competences, or a personal skill set, are what enables an individual to problem-solve and create, using the method that makes the most sense to them (Gardner, 2011).

There are also objections to “…the claim of independance among the eight intelligences...” (Willingham, 2004). This is a contrast between the idea that intelligence is a single measurable property of each individual, vs. the ability to problem solve in a variety of ways. Gardner argues that the eight intelligences proposed in Frames of Mind are eight different ways that people understand and intake information, and later use that information, but they may not be the only and absolute ways to do so (Gardner, 1985). Gardner does assert that everyone possesses each of these eight intelligences to some degree, because “intelligence is a property of all human beings”, and he defines intelligence as the way an individual carries out a task (Gardner, 2011).

There is no resolution between the friction created by this difference of ideas, because there is no absolute answer to what intelligence is, or how to measure it. The argument that “…the fact that the theory is an inaccurate description of the mind makes it likely that the more closely an application draws on the theory, the less likely the application is to be effective” (Willingham, 2004), assumes that more traditional views of education are the only valid view on learning, and that using Gardner’s theory creates invalidity. Gardner proposes MI theory to demonstrate the ways in which people learn. In turn, this gives educators a variety of ways they can provide opportunities for learning, and this study works on the
assumption that increased opportunities for learning leads to more learning.

2.4 Case Study Research in Education

The format for this research project is a case study as defined by Merriam (1998) and Yin (1994). This study is a small sample, from a single location, designed to form a thorough understanding of this one population as they interpret the new National Compulsory Curriculum. Knowledge gained from this study may give insights into larger patterns surrounding curriculum and classrooms in Iceland. Specific aspects of an effective case study that closely compliments the issue and type of data being examined in this study are further defined by Yin and Merriam below.

Yin (1994), defines a case study as “an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident”.

Case studies are an appropriate tool when additional information is needed on a current event, or ongoing situation. A research project has innate limitations in the amount of data that can be collected, or it is useful to collect. An effective study allows inquiry into a real-life and/or real-time phenomenon or group, without the researcher having to study everyone who has been affected, often an impossibility. In addition, the possibility that inaccuracy may arise in data when “the boundaries between phenomenon and context are not clearly evident” is a very likely one. The smaller sample size in a case study allows more time to be spent looking for patterns and the relationships between contextual and phenomena related factors, and a more accurate overall picture may be achieved.

In the second and closely related definition, a qualitative case study is described by Merriam (1998), as “an intensive holistic description and analysis of a single instance, phenomenon, or social unit.” If the goal of the research project is an accurate, overall review, a case study with qualitative methods is an effective whole-picture approach. A social unit or phenomenon may have many influential factors unanticipated by the researcher, and an in-depth approach will allow greater insight into what factors are present, and how they relate (Merriam, 1998). This is a contrast to qualitative approaches such as discourse analysis, which focus on analyzing spoken and written dialog in an effort to see and deconstruct underlying power relationships within a social or societal group (LeGreco, 2014).
This study seeks understanding about what is actually happening in Icelandic classrooms, and uses a single classroom as an example of how the National Curriculum is interpreted in a practical way. It does not aim to provide proof of how classrooms and curriculum are related, but serves as a source of information. It is the foundation for new knowledge and additional research on the topic.

2.5 Multiple Intelligences in the Classroom

Thomas Armstrong discusses practical ways to test, identify, and foster children’s MI inclinations in the classroom in his book *Multiple Intelligences in the Classroom* (2009). Multiple Intelligences (as opposed to the theory) can be used to classify activities and instruction based on 8, or any number, of categories. Gardner does not consider this an absolute set of how people learn, or that all eight must be memorized and used in each lesson, but instead as a strategy for providing additional ways that students can learn information in a way that makes sense to them.

Armstrong gives examples of what MI look like within the context of specific classroom subjects and activities. For example, representing linguistic intelligence in math, science, reading, writing, and social studies could look like: reading math problems, talking about the founding scientific principals behind a reaction, reading a book, writing about your own experience, and writing about social conditions surrounding a historical event. Armstrong’s well-defined ideas about what qualifies as a certain MI serve as a solid foundation for data collection on teaching methodology (2009).

<table>
<thead>
<tr>
<th>Children who are strongly</th>
<th>Think</th>
<th>Love</th>
<th>Need</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linguistic</td>
<td>in words</td>
<td>reading, writing, telling stories, playing word games</td>
<td>books, tapes, writing tools, paper, diaries, dialog, discussion, debate, stories</td>
</tr>
<tr>
<td>Logical-Mathematical</td>
<td>by reasoning</td>
<td>experimenting, questioning, figuring out logical puzzles, calculating</td>
<td>Materials to experiment with, science materials, manipulatives, trips to the planetarium and science museum</td>
</tr>
<tr>
<td>Spatial</td>
<td>in images and pictures</td>
<td>designing, drawing, visualizing, doodling</td>
<td>art, LEGOs, video, movies, slides, imagination games, mazes, puzzles, illustrated books, trips to art museums</td>
</tr>
<tr>
<td>Bodily-</td>
<td>through somatic</td>
<td>dancing, running, jumping, building, touching, gesturing</td>
<td>role play, drama, movement, things to build, sports and physical</td>
</tr>
</tbody>
</table>
Table 1: Armstrong’s Eight Ways of Learning (Multiple Intelligences in the Classroom, p. 22)

In addition, Armstrong’s table on Eight Ways of Learning outlines how MI translate into thinking processes, preferred activities, and materials needed to learn (2009). Understanding how MI is manifest in the classroom can assist in the data collection of this research with concrete examples of how MI inclinations can be observed in an individual’s actions. His figure 3.1 outlines some of these examples.

This table was used as a basis for determining what kinds of classroom activities and student behaviors might be categorized as each MI, and contributed to the overall methodology of the study by focusing observations. This is further discussed in the next section, Methodology.
3 Methodology

The goal of this research project was to create an accurate overall picture of what is happening in one classroom, and how that relates to student learning and the National Compulsory Curriculum. As a result, a case study was selected as the most effective whole-picture approach. This format added information about what is actually happening in Icelandic classrooms, and uses a single classroom as an example of how the National Curriculum is interpreted in a practical way.

3.1 Case Study Approach

This thesis project is a mixed methods case study (Yin, 1994) of one Icelandic grade-school classroom. Data collection is mixed qualitative and quantitative methods on student’s MI inclinations, classroom methodology, and national curriculum. Analysis is based on observed patterns and contrast in collected data, using the framework of Gardner’s eight MI.

A case study is intensive research on one instance, person, social group, or phenomena with the aim of getting the whole picture of what is happening (Merriam, 1998). What distinguishes a case study from other research methods is that it “attempts to examine...a contemporary phenomenon in its real-life context, especially when...the boundaries between phenomenon and context are not clearly evident” (Yin, 1994). Case studies are also inherently defined by these definitions, they are one group, one class, or one event, what Merriam calls a ‘Bounded System’ (1998). Case studies are also known for having diverse methods, using many forms of data collection, both qualitative and quantitative methods as applicable, to get the most comprehensive understanding of what is happening (Merriam, 1998).

This research was conducted as a case study of a single classroom to look at information that could only be examined in context. In order to see what is actually happening in this classroom, and what the written curriculum looks like in practice, something that is not easily separated from teaching practices, a case study was deemed most applicable.

These methods were selected as the most effective way to collect detailed knowledge about how classroom practices overlap with curriculum and the way students learn, and gain a thorough understanding of this one
population through intense research and detailed analysis of this one classroom. Knowledge gained from this study may give insights into larger patterns surrounding curriculum and classrooms in Iceland.

In addition to seeking information, this study attempts to bring attention to the research issue, whether students spend their classroom time engaged in activities that allow them to utilize and develop their preferred learning inclinations.

3.2 Data Collection Methods

Qualitative methods for this study are classroom observations and interviews (Merriam, 1998). Observations took place from the 19th of April to the 4th of May 2016, for a total of 32 hours over 7 days. Observations were conducted in an observer as a participant format (Merriam, 1998). The classroom teacher and students were all aware of the researcher’s purpose in the classroom, and were shown example observation notes on request. Observations focused on MI in teaching practices, lesson formats, and classroom procedures, and the choices of students during free time, or choices that were different from classroom instruction. Data was collected in a running record format in increments of 5-15 minutes, and categorized into 1-3 of the case study MI at the end of each observation day. See figure 1.
Figure 1: Example page from Classroom observations. Class activities were recorded, along with duration and observations on participation. At the end of each day, activities, directions, and participation were sorted into one to three MI categories.
There were two semi-formal interviews (Merriam, 1998), one with the case study teacher, and one with the school Principal. They were composed of open-ended questions focusing on teaching style, effective methods of instruction, and interpretation and overall impression of Iceland’s National Curriculum. A third interview section arose out of conversations with teachers while at the observation school. This is feedback on teaching experience, instruction, and the National Curriculum.

Quantitative Methods (Yin, 1994) proposed for this study are an MI survey of the case study students, counting MI used in instruction, and categorizing the National curriculum of Iceland. The survey was 39 questions that asked students what they like, and what they are considered ‘good at’. Questions were randomly ordered, and the survey took 30 minutes to complete, with time for a break and an interruption by a bird outside the window. The survey was written in Icelandic, approved by the classroom teacher, and each question was read aloud.

Figure 2: This is an example page from the National Compulsory Curriculum of Icelandic after analysis into MI categories.
Figure 3: Example questions from the MI survey given to students.

Questions were randomly numbered, and students’ answers were scored based on the largest or darkest mark. For question #7, the student answered first closer to Ekki Ég, but made a larger, more prominent mark in the middle, and was scored at two. On question #99, the student made and erased several answers before making a large, dark mark on Ekki Ég and was scored at zero.

It is worth noting that a survey is not an ideal way to assess the diversity of student MI inclinations. A written survey read aloud by the classroom teacher requires linguistic ability, high auditory comprehension, and patience for a long sitting activity. This method was selected as a way to get student participation and perspective in research about them, while impacting the classroom as little as possible. Methods including individual student interviews or in-depth individual observations were deemed too invasive.
3.3 Data Analysis

The basis of data analysis for this study is within the framework of Gardner’s 8 MI, linguistic, musical, logical-mathematical, visual-spatial, bodily-kinesthetic, naturalistic, interpersonal, and intrapersonal intelligence. After observations, notes were analyzed into two categories, instruction or student choices, and sorted into one or more of the MI categories. The subject areas of the National Curriculum were sorted in a comparable way, with special attention focused on what kinds of activities were suggested, and how frequently the same ideas were used. This data was compared to the outcome of student’s MI surveys.

Data was collected into data points, for example each instance of Bodily-Kinesthetic behavior observed in students is a single point. Instances of behavior or classroom activities that fell under multiple MI were given up to 3 MI categories, each worth one point. For example, an activity where students danced to classical music would be categorized as musical, and Bodily-Kinesthetic, for a total of 2 data points. Additional considerations were applied in context, such as students being asked to dance in pairs (Interpersonal) or design their own choreography to the feeling of the music (Intrapersonal).

These points were used to calculate 3 different aspects of the study. MI categories were used as a part of classroom practices and structure, to what extent and in which ways MI were used, and if students demonstrated preferences for learning strategies. These results were used to compare overall themes in participation, learning opportunities and strategies, and develop a clear idea of what MI looked like in the case study classroom. As discussed in the results section, this led to a comparison of classroom and student MI in order to better understand how the case study classroom is meeting the needs of students.

Within the National curriculum, subject areas were also used to collect data points. Learning outcomes, suggested teaching strategies, and methods of assessment were all included in this analysis. Additionally, analyzing the written curriculum as a document gives “...contextual richness and helps ground an inquiry...”, particularly in real world issues (Merriam, 1998). This data was particularly crucial in answering the research questions, and it brought focus to themes from the curriculum, including education for overall wellbeing, democratic processes, creativity, and action competence.
3.4 Discussion of Ethical Issues

In this section several ethical issues affecting the formation of the study, classroom observations, and aspects of vulnerable populations are addressed.

3.4.1 Vulnerable Population and Privacy

This research was partly centered on observations and a survey of grade school students. In order to preserve privacy, observations focused on the classroom as a whole, and students were never named individually. In addition, the age range of students is described as a range of 7-9, a three year age range tripling the possible study population.

The survey questions were cleared by the classroom teacher, and student participation was optional. The researcher was introduced to the students as a classroom observer, and no names or personal information were recorded in the observations and MI surveys for this study. Surveys were shuffled and randomly numbered before results were calculated to avoid interpreting results based on individual student behaviors. Additionally, since no names were ever recorded, even the researcher has forgotten which students had which MI scores, or anything else specifically attributed to individual students, which seems like an excellent way to ensure privacy.

3.4.2 Case Study and Observation Approach

It is worth noting that a study with interviews and a greater focus on student’s opinions of their school experience would have better represented students in the case study classroom. Due to issues of privacy and vulnerable populations, such methods were not considered for this study. Instead, the focus of this research is on the similarities and differences found in comparing student learning inclinations against classroom practices and guidelines from the Icelandic National Curriculum.

3.4.3 During the Course of the Study

During the course of the study, three ethical issues arose: student privacy, researcher integration, and the purview of the study.

The conflict between observation and student’s right to privacy occurred several times when students became visibly upset due to peer conflicts or teacher corrections. If students looked at the researcher, or otherwise seemed concerned that notes were being taken, observations stopped with
pencil down and notebook closed until the conflict was resolved. Students have the right to privacy and comfort in their own classroom that takes priority over research actions. This was preserved to the best of the researcher’s ability.

An unanticipated aspect of this study was researcher integration in the classroom dynamic. Students were, of course, very curious about the researcher and research notes. As a result, during the lunch break, students often asked what the researcher was writing about, and were shown the contents of the observation notebook, including counting charts, copies of drawings and notes from the board, and sketches of classrooms.

Lastly, the observations and interviews for this study generated more than 100 pages of notes, some of which were later determined as outside the scope of the study. These notes are not included in the data for the study.

3.4.4 Interpretation

Due to the mixed methods of this study, some adaptations were made to the format of the thesis. In order to separate data analysis and interpretation of that analysis, this work has sections on results and on findings. This helps in keeping a division between data and researcher interpretation.

Additionally, when analyzing observable student behaviors into MI categories, interpretable results were left uncategorized. For example, when categorizing students drawing and doodling during lessons, it was not possible for the researcher to determine what and why students were drawing. Such instances were categorized as Bodily/Kinesthetic, without additional applicable categories including Intrapersonal or Visual/Spatial. Exceptions to this did occur and were categorized according to context, including a student drawing a picture of family and hobbies (Intrapersonal) or drawing very deliberate color coded grid patterns (Visual/Spatial).

3.4.5 Rights of Students

Students in Iceland are legally required to attend school from ages 6 to 16. The Ministry of Education, Science, and Culture “is responsible for the implementation of legislation pertaining to all school levels from pre-primary and compulsory education through the upper secondary and higher education levels, as well as continuing and adult education. This includes the tasks of creating curriculum guides for pre-primary, compulsory and upper secondary schools, issuing regulations and planning educational
reforms” (Ministry of Education, Science and Culture, 2014). So what obligation does Iceland have to make sure its curriculum and mandatory schooling are relevant and appropriate for students? This is addressed in the national Curriculum as student’s rights to free opinion, expression and development of skills and hobbies, and an education that is relevant to themselves and their future. This is further discussed in section 4.3, results from the National Curriculum of Iceland.

### 3.4.6 Summary

Overall, there were few anticipated ethical issues for this study, and those that arose were addressed with student privacy having the greatest weight. Issues in interpreting results were addressed by keeping two separate findings and results sections, and dividing the classroom data analysis into classroom vs. student observations.
4 Results

This section catalogs four sets of data collection. First, results from the classroom observations are described, including what students spend classroom time doing, compared with what students chose to do during lessons and free time. Second are the results of the Multiple Intelligences survey from seventeen participants. Third, themes from the National Compulsory Curriculum of Iceland are discussed. Lastly, the classroom teacher, school principal, and informal interviews are discussed.

4.1 Observations

Information collected on instruction, classroom practices, and classroom materials led to 542 data points within the 8 MI categories, and observations of classroom behavior led to 962 data points. This is compared in Figure 4, where classroom practices can be compared to observable student behavior.

![Figure 4: Observations Data Graph Information collected on instruction, classroom practices, and classroom materials led to 542 data points within the 8 MI categories, and observations of classroom behavior led to 962 data points.](image-url)
4.1.1 Instruction vs. Student Choices

Classroom instruction and practices fell overwhelmingly within Linguistic (22%), Bodily/Kinesthetic (20.5%), Interpersonal (18.3%), and Visual/Spatial (17.7%). These 4 MI made up a total of 78.5% of classroom time in the observation classroom. What this looks like in practice is:

Nearly a quarter of all school hours involved activities based in literacy: verbal instruction, reading, writing, or the teacher asking for a verbal response. For example, in observations on day 2, at 8:34 the classroom teacher wrote the names of 5 literacy activities on the board and began explaining what each activity was. These activities were word decoding, writing postcards, writing example words, finding words in a grid, and taking turns reading aloud. The teacher gave verbal directions and answered questions an additional 9 times until the activity ended just short of an hour later at 9:28. Within these 54 minutes, there are 21 Linguistic data points from directions and literacy activities, 3 visual/spatial, 1 logical/mathematical and 4 bodily/kinesthetic for switching stations. During these 5 activities, students are also recorded as asking questions, chatting, getting colored pencils to work with, closing the window blinds, and working in groups, adding 3 Interpersonal, 3 Intrapersonal, 1 Linguistic, 2 Bodily/kinesthetic, and 1 visual/spatial point.

In the observations data graph, Figure 4, a large discrepancy between classroom and students can be seen in Visual/Spatial, Bodily/Kinesthetic, and Interpersonal MI. Students overwhelmingly spent their free time, or spent time during lessons, engaging in activities based on movement, coordination, or being social. Some of these instances can be attributed to classroom structure, such as students almost always having the option to work quietly with another student or get up for a drink of water. Other data comes from free play activities, such as coloring, cutting and gluing, building with blocks, and social play, or data from students choosing not to do the classroom activity, and instead choosing to chat, read a book, color, play with putty, crawl under desks, or stare into space.
### 4.2 Multiple Intelligences Survey

These are the results of the MI survey given to students in the observation classroom. Each question has a possible score of 0-4 with a possible scoring range for each MI anywhere from 0-20.

<table>
<thead>
<tr>
<th>Participant</th>
<th>Bodily-Kinesthetic</th>
<th>Visual-Spatial</th>
<th>Linguistic</th>
<th>Logical-Mathematical</th>
<th>Naturalistic</th>
<th>Interpersonal</th>
<th>Intrapersonal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1</td>
<td>13</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td>19</td>
<td>14</td>
<td>12</td>
</tr>
<tr>
<td>Participant 2</td>
<td>18</td>
<td>18</td>
<td>20</td>
<td>16</td>
<td>16</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Participant 3</td>
<td>18</td>
<td>18</td>
<td>20</td>
<td>16</td>
<td>14</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>Participant 4</td>
<td>18</td>
<td>18</td>
<td>20</td>
<td>16</td>
<td>14</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Participant 5</td>
<td>18</td>
<td>18</td>
<td>20</td>
<td>16</td>
<td>14</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>Participant 6</td>
<td>18</td>
<td>18</td>
<td>20</td>
<td>16</td>
<td>14</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>Participant 7</td>
<td>18</td>
<td>18</td>
<td>20</td>
<td>16</td>
<td>14</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Participant 8</td>
<td>18</td>
<td>18</td>
<td>20</td>
<td>16</td>
<td>14</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>Participant 9</td>
<td>18</td>
<td>18</td>
<td>20</td>
<td>16</td>
<td>14</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>Participant 10</td>
<td>18</td>
<td>18</td>
<td>20</td>
<td>16</td>
<td>14</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>Participant 11</td>
<td>18</td>
<td>18</td>
<td>20</td>
<td>16</td>
<td>14</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>Participant 12</td>
<td>18</td>
<td>18</td>
<td>20</td>
<td>16</td>
<td>14</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>Participant 13</td>
<td>18</td>
<td>18</td>
<td>20</td>
<td>16</td>
<td>14</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>Participant 14</td>
<td>18</td>
<td>18</td>
<td>20</td>
<td>16</td>
<td>14</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>Participant 15</td>
<td>18</td>
<td>18</td>
<td>20</td>
<td>16</td>
<td>14</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>Participant 16</td>
<td>18</td>
<td>18</td>
<td>20</td>
<td>16</td>
<td>14</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>Participant 17</td>
<td>18</td>
<td>18</td>
<td>20</td>
<td>16</td>
<td>14</td>
<td>12</td>
<td>20</td>
</tr>
</tbody>
</table>

**Figure 5: Results from Student MI Surveys**

Note: Participant 5 listened to the MI questions and directions, and had a survey, but chose not to answer any questions. Participant 5 does read and write. For the purposes of these sections on findings and discussion, participant 5 will be excluded from any further analysis.

In this survey, students overwhelmingly report their highest skills and interest in Bodily/Kinesthetic intelligence, followed by Naturalistic, Visual/Spatial, and Logical/Mathematical Skills. Questions on these intelligences asked students if they felt they were good at, or enjoy doing activities within the MI, such as reading or writing under the Linguistic MI.
The lowest ranking MI was the Intrapersonal Intelligence. Participants reported Intrapersonal MI at an average of 25% below the Bodily/Kinesthetic intelligence. There are notable differences in the responses to each MI, which will be further discussed in section 5, Findings.

4.3 National Compulsory Curriculum of Iceland

Overall, the National Curriculum of Iceland had strong themes of democracy and learning as preparation to be a productive member of society, a well rounded and relevant education, and health and development for life. These are complex concepts that were repeated through the introduction to the curriculum and the individual subject areas.

Education for democracy and citizenship is one of the most common themes of the national curriculum. In this context, one of the main purposes of education is to provide students with the life skills to become a productive and voting member in society that can fully participate in the democratic process. In classroom practice this takes a variety of forms. Students are encouraged and allowed a lot of independence. Children as young as 6 make their way independently to other classrooms, and at age 7 they are able to take the public bus to and from swimming lessons. Additionally, literacy and critical thinking skills are emphasized in the competence markers for the majority of subject areas. These are practical skills that students will need to obtain information, critically analyze it, and then fully participate in the democratic processes of Iceland.

The overall goal of students having a well-rounded and relevant education is discussed as two contributing factors in the National Curriculum; first, as students having the opportunity to develop hobbies and skills, and secondly, as an educator’s responsibility to teach in a way that is applicable and relatable. Icelandic language, music, arts and crafts, and sports are all subjects with specific markers on students developing their own interests and skills. This includes exploring types of poetry and creating their own, time for freestyle swimming, music and literacy as personal expression, and handicrafts as a transfer of culture and an opportunity for skill development. Teaching methods for all lessons should integrate multiple subjects and actively demonstrate how what is being learned is applicable to students. In practice, competence markers demonstrating this include being able to describe their own nutritional needs, explaining the importance of hygiene in sports, selecting and
presenting concepts in the natural sciences, and doing observations in a lab setting and in nature.

Health and development for life is a theme that is strongly present in the curriculum. These are skills students should be developing in school that contribute to healthy relationships, emotional wellbeing and management, and active physical hobbies. It is the view of the National Curriculum that students who make friends in school will be able to make friends as adults, and that this is a foundation for healthy communication and connections throughout life. This is the same expectation the curriculum has for physical activity and emotional wellbeing. If students are actively practicing these skills as children, they will be better equipped to choose healthy choices as adults. Examples of these expectations can be seen in the competence markers in many subject areas, and include sportsmanship, body consciousness, writing about feelings and relationships, and showing consideration in play and work.

4.4 Interviews

Interviews were necessary for this case study both a background on the school, and perspectives on working with the new guidelines of the national compulsory curriculum. Interviewing can be one of the best ways to get information in an intensive case study, as this may be the only way to gather insight and perspective from the participants (Merriam, 1998). The classrooms teacher and principal interviews for this study were both informal and semi-structured, and the informal interviews arose over the course of the study and were unstructured (Merriam, 1998).

4.4.1 Teacher Interview

On May 4th 2016, I conducted a forty-five-minute interview with the observation classroom teacher on the topics of the national curriculum, individualized instruction, and the experience of teaching. For the purposes of this research I will call the classroom teacher Svandís.

Svandís has worked as a classroom teacher for more than 15 years. She left a desk job at a large company to go to school for teacher training and certification, and began teaching early in the 2000’s. She wanted a meaningful job helping children, and work that coincided better with family life. Teaching seemed like a good match to her interests and let her spend afternoons and summers at home. Svandís said she had always had an interest in teaching, because she herself had not had a good school experience. “The reason I went into teaching was because I was bullied
everyday, and I thought if I could help one child”. Svandís takes extra care to know each child in her class and every family. I also watched her greet at least one hundred students around the school by name, and students talked to her easily. She makes a point of getting to know students who stay on the edges of the playground, or seem quiet in the lunch-room.

Svandís has a copy of the national curriculum on her desk. The teachers of the school worked together to look through the curriculum and find ways to incorporate it into their classrooms, because it can’t be done the way described in the subject areas of the curriculum. She feels she is not able to do what the curriculum asks because the support is not there for teachers. Training, planning, and steps for meeting the curriculum’s goals are an unfulfilled need. “I look at it (the curriculum) to see what I should be teaching them over the winter. I don’t look at it for anything else because it doesn’t help me or the children.” The curriculum says subject areas should be taught 40 minutes a day, but Svandís doesn’t think that is possible either. Students need time to transition between activities, and they have disagreements, or days when they need more time on one subject than another. Sometimes they just can’t concentrate, and overall it’s very rare that they actually get 40 minutes of subject instruction.

What the classroom currently looks like is a lot of individualized practice. “I have 19 kids and I explain it to (hand motion to the left) ‘oh, yeah’ and the next one I have to draw something. Sometimes I have to explain it 19 different ways.” She groups students based on who can cooperate, and generally ends up checking on each child to make sure the material has been learned. But Svandís says she is lucky with a really quiet class this year. Not every class is so quiet, and plenty of other teachers can’t do the same. She wouldn’t be able to do the same with another class, because it’s difficult enough to manage it now.

Svandis recommends that curriculum writers spend more time in classrooms to see what will work for them. She currently describes her time and resources as 50% spent on teaching, and 50% other things she doesn’t think she should be doing. There is a greater demand on teachers to have meetings, and document their physical time in the classroom. When she began teaching, Svandís was able to finish all the things she needed to do within the school day, then took home materials to plan for the next day. Now there’s a perception that teachers aren’t working enough, but Svandis says good teachers are always thinking of their students, and work doesn’t stop during lunch or after school hours. “We are really trying, all teachers.”
4.4.2 Principal Interview

Also on May 4th 2016, I conducted a 30-minute interview with the observation school Principal on the topics of school demographics and the national curriculum. For the purposes of this interview, I will call the principal Anna.

The observation school has more than 200 students from the ages of 5 to 16. It is one of several schools in the immediate area that serve the surrounding neighborhoods, and in the last 10 years they have seen a surge of young families moving into the area. Student numbers over 700 in the immediate area, and that’s high enough that they have run out of classrooms and a new school may be necessary.

Anna describes the new curriculum as not so different from the old one. The biggest difference is in the competences expected at each age. This year will be the first year with graduates of the new requirements.

Over the winter the school received further guidelines from the state, and teachers worked together to update the school’s curriculum. It is now much more grounded than when the national curriculum came out, with specific goals and assessments. Overall, Anna thinks that the national curriculum will help focus classroom teaching, but thinks it will take at least 5 years to settle in effectively. Then she and the teachers across Iceland will have feedback on what is working, and what isn’t.

When asked if there was something she would change about the current curriculum, Anna wished for clearer guidelines on ‘uniformity of assessment’. As previously stated, this year’s students are the first to graduate based on the new competence guidelines, and schools all have a different method of assessing how they have met this requirement. There is no standard or guidelines for assessing graduates, so there is no consistency in assessment. As a result, Anna thinks the High Schools (ages 16-20) and universities will have an incredibly difficult task in assessing student qualifications, and in getting them back to the same academic level.

4.4.3 Informal Interviews

As a side note, I spent half an hour in the staff room during each lunch period of my observation time, and spoke casually, but with research consent, with the teachers on staff. Repeating themes of conversation were a comparison of teaching methods in the US and Iceland, and teachers expressing what they wish were different about the current Icelandic education system. I spoke about these topics with 7 teachers.
Overall, teachers expressed their frustration at not getting the support needed from the school and community to educate students well. They feel they are using outdated teaching methods that are very traditional, but do not get them the results asked for by the state, leaving the curriculum creators and parents frustrated. That frustration is then taken out on teachers. They think that students are not expected to have good behavior in school, are not held accountable for their actions, and that they as teachers are powerless to fix the problem. They also felt that trying new methods of instruction to fix classroom problems was discouraged, and parents and the school system expected increasingly better results with less resources and very traditional teaching methods.

These interviews were not planned at the beginning of the study, but gave a unique perspective on what teaching looks and feels like to those transitioning from the old to the new curriculum. These were unstructured interviews (Merriam, 1998) and were conducted to collect information on teaching experience.
5 Findings

5.1 Student MI Survey

The 16 MI surveys that yielded data gave each participant a different Multiple Intelligences ‘score’. Participants self-reported interest and skill in each of the 8 categories, for a total value of up to 20 in each MI. No reporting participant recorded a total score of 0 or a full score of 160. Values fell between 40 and 146, and had an average score of 113.125. The median scores were 116/118.

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<td><strong>146</strong></td>
<td><strong>113</strong></td>
<td><strong>116/118</strong></td>
<td>/</td>
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</tbody>
</table>

Table 2: Analysis of Student MI Surveys

A discussion and analysis of scores is not meant to attribute greater value to a specific MI intelligence, or argue that these scores represent the capability or capacity of students. They are, for the purposes of this research, a self-reporting survey of student’s interests and assessment of their own capabilities. This information was collected with the intention of comparing student’s self-reported interests and classroom choices with teaching methods and the competence goals of the National Curriculum. This is particularly valuable when looking at the results for each intelligence.

5.1.1.1 Linguistic

Linguistic scores fell between 6 and 20, with an average score of 13.8. Seven participants reported a score of 16-20, and 6 a score of 11-15, meaning 13 of 16 participants report 51-100% interest and/or confidence in linguistic practices. No participants report a score of less than 6, and the
most common responses were 11 and 18. This is a strong division in linguistic intelligence, with a nearly even split among students who have a very high vs. middling inclination for activities includes reading, writing, and spoken words and directions. In general, the observation classroom’s high rate of linguistic activities and instruction (22% of the time) is a good match for these students, who all reported a comfortable or high interest/skill in linguistic activities in the MI surveys.

5.1.1.2 Musical

Musical scores fell between 7 and 20, with an average score of 13.6. Musical was the second lowest reported MI overall, with 4 participants reporting a score of 26-50%, and only 4 reporting in the 76-100% range. Additionally, 8 participants reporting a score of 12-14, which seems low for such young students. Overall, these scores divide the class into surprisingly even groups, with one quarter of participants reporting 90% skill or preference, half reporting 60-70%, and one quarter reporting 50% or less. This is not representative of the ideals for music in the Icelandic National Curriculum, which describe music as integral to personal lives, creation and communication, and a part of what defines culture and cultural literacy. At the same time, music accounts for only a page and a half in the national curriculum, and there is no expectation of subject integration in the assessment markers for music.
Figure 6: Student survey responses are grouped into categories from 0-100% for each MI. For example, Visual/Spatial had 1 students reporting they enjoyed or were good at up to 25% of these activities. In contrast, 15 students reported themselves at 51-100% of these activities.

5.1.1.3 Logical/Mathematical

Logical/Mathematical scores fell between 6 and 19, with an average score of 15.2. 9 participants reported a score of 76-100%, and only one participant reported a score of 50% or less. This indicates that while the majority of the class is familiar and somewhat comfortable with math, numbers, and logic skills, a single student is not interested in or finds numbers and logic difficult. This is a large disparity within the classroom, with one student reporting 6, and the next closest score at 12, and the most commonly reported score at 18. This disparity was seen during math lessons. Around a third of the class used only 10 or 15 minutes of the allotted 30-40 to complete the assigned page of the day before moving on to math games or activities. Another third finished in the last few minutes, or didn’t quite finish, and the same few students never finished within the lesson time. Factors and details of math instruction will be covered more fully in discussion section 5.1.2 for the MI surveys.
5.1.1.4 **Visual/Spatial**

Visual/Spatial scores fell between 2 and 20, with an average score of 15.3. The average score here is slightly misleading. One participant reported a score of 2, but the next lowest score, and most commonly reported, is 14. All other participants score between 51-100%, with a total of 8 participants reporting at 76-100%, and the other 7 at 51-75%. Overall, this makes visual/spatial a strong learning inclination for nearly the entire class. Students in the case study classroom used Visual/Spatial MI in a variety of observable ways both in free play and as adaptations to lessons. Free play examples from observations include drawing, arcade games (computer), physics problem solving games (computer), coloring using negative space, and making patterns in beading. As adaptations to lessons, students were seen doodling patterns while listening to instructions or read aloud, using colored pencils to sort shapes in math and to identify words in word search tasks, using a math grid to add and subtract, and using the daily schedule on the board for reference.

5.1.1.5 **Bodily/Kinesthetic**

Bodily/Kinesthetic scores fell between 0 and 20, with an average score of 16.3. This is the highest average of the survey, with 4 participants reporting a full score of 20. A total of 12 participants reported a score of 76-100%, indicating a strong preference or skill in physical activities, including gross motor activities (running, climbing, walking, balancing, etc.) and fine motor activities (drawing, beadwork, sewing, woodworking, etc.) The single participant that reported 0 is an outlier, and there is a wide gap between this participant (Participant Four further analyzed in Figure 8) and the next lowest score of 12. This is also a very surprising answer to see from a child in this age group. Survey questions included if students liked or thought they were good at any sport, or if they enjoyed gym or recess more than other classes. Based on a score of 0, this may be a student who finds sports and physical activities very difficult and/or has very low self esteem. A more detailed analysis and recommendations for this participant and two others can be found in later in this section in 5.1.3, individual student MI surveys.

5.1.1.6 **Interpersonal**

Scores for Interpersonal fell between 0 and 20, with an average of 13.8. Half of participants reported a score of 16 in this intelligence, and outliers at both 0 and 20 were reported only once. Participants overwhelmingly reported that they would prefer to work in a group rather than alone, with
the exception of the outlier at a score of 0. Overall, this indicates that at least half of students in this classroom are very motivated in a social context, and that friends and friendships are very important to them. Further research would be needed to determine how and when students preferred to work together, but examples from the case study classroom include almost all students preferred to work with a partner during math and up to three students would move to their chosen partner, and there are only five instances over the course of the study where students chose to do a solitary activity during free play.

5.1.1.7 Intrapersonal

Scores for Intrapersonal fell between 4 and 14, with an average score of 10.4. This was the lowest average for the MI Intelligences, with no participant scoring themselves at 76-100%, and half of participants scoring themselves at 50% or less. The highest reported scores were 3 participants reporting 14 out of 20. Overall, this indicates a general lack of comfort, practice, or preference for activities done alone, self-regulation and perhaps self-esteem. This is a surprising finding considering the amount of independence that is encouraged and built into the case study classroom, and the emphasis that the national curriculum places on independence, democracy, and problem solving. Students in this age group take the public bus to school and to the nearby swimming pool by themselves, feel comfortable moving around the classroom and working anywhere, and take themselves to classrooms around the school for woodshop, art, and handicrafts independently, but this does not translate into feelings of independence, investment, planning, and self-regulation.

5.1.1.8 Naturalistic

Naturalistic scores fell between 8 and 20, with the second highest average score of 15.6. A total of 9 participants reported in the 76-100% range, and 7 of those participants reported a score of 90% or higher. Only 2 participants reported in the 26-50% range, and none in 0-25%. This indicates that all participants have some interest or skill in the naturalistic intelligence, and for the majority of students it is one of their strongest intelligences. In a school context, this might be a marked preference for natural materials, time spent outdoors, or learning about the natural world. In the observation classroom, this was very consistently seen when the class’s annual nesting bird would appear at one of the skylights and tap its beak on the glass. All students unfailingly ran to where they could see it best, including the tops of desks, and would spend several minutes
discussing aspects of it’s appearance and habits. This often led to
discussions of what birds eat, migration patterns, nesting behavior, other
birds native to Iceland, and other animal sightings at home or on the
playground.

5.1.2 Discussion on Classroom MI Surveys

Overall, students overwhelmingly report their highest skills and interest
in Bodily/Kinesthetic intelligence, followed by the closely ranking
Naturalistic, Visual/Spatial, and Logical/Mathematical Skills. These
intelligences are what students perceive themselves as being good at, or
enjoy doing. These is partially reflected in classroom practice, where
students spend 20.5% of their time with opportunities for movement, and
17.7% of time with instruction or classroom activities that involve
visual/spatial. And yet, students still want to spend more time moving, and
interacting with peers. These are children under the age of 10, and when
they have the opportunity to move around the classroom or building, they
almost always took it, and if there was not opportunity to move, they often
did so anyway. This led to observable behaviors in the classroom including
fidgeting, playing with putty, standing or sitting on the floor to work, or
crawling under desks. They also overwhelmingly choose to work and play
together in any circumstance, including to the exclusion of the classroom
lesson.

By contrast, the lowest ranking MI was the Intrapersonal Intelligence.
Participants self-reported Intrapersonal at an average of 25% below the
Bodily/Kinesthetic intelligence, and this many be an indication that they are
generally less confident in independent work, self-regulation, and self-
confidence. It would be interesting and worthwhile to do further research
on why the written and classroom curriculum does not translate into
students feeling capable and empowered.

The results of the Logical/Math section of the MI survey compared to
classroom practice for math lessons in also particularly interesting to note.
Along with the completion time disparity discussed in section 5.1.1.3, there
is also a notable difference between the number of questions asked by each
student over the course of the lesson. The current format for math lessons
is that students receive instruction from the teacher at the start of each
chapter, then complete the assigned page for the day and each day after
independently. This is in keeping with the national guidelines of the
Compulsory Curriculum of Iceland, that students work autonomously and
confidently on math, but not in keeping with the ideas emphasized in the
introduction of the subject area and competence markers. These place greater weight on using mathematical language appropriately in discussions, trying out problem solving ideas, and teaching practices that maintain a high level of interest and relevance in math instruction.

In the observation classroom, students are allowed to work in small groups or alone, and use tools including number grids and counters to problem solve. Despite this, observations showed that students wait 2-8 minutes each time they have a question before it is answered by the teacher, and that’s time not spent on math. There is a large disparity between students who work very effectively during math and have only one or two questions, and students who have four or more questions. In this system, students who have the most questions can spend twenty or more minutes of the lesson waiting for assistance, losing the time they need to work on their assigned page. This does not address the differences in individual student’s math confidence and competence as seen in the MI survey and observation results.

5.1.3 Individual Student MI Surveys

For further discussion, 3 student surveys have been selected for in depth analysis, participants 4, 10 and 17. Participants were selected for this based on being outliers, as is the case for #4 and #14, or being a median scoring participant, like #17.

5.1.3.1 Participant Seventeen

![Figure 7: MI Survey Results from participant #17](image)
Participant 17 had a median MI survey score of 118. This participant answered every question, but could not be scored on Question 52 (How easily do you put together things like toys, puzzles or electronics?) because they appear to have selected every possible answer. This survey conforms to the average class score for Linguistic, Musical, Visual/Spatial, and Interpersonal MI, is slightly below average in Logical/Mathematical, and above average in Bodily/Kinesthetic, Intrapersonal, and Naturalistic MI. They reported no score of 0 or 20.

Overall, this looks like a student who is fairly confident in the assessed abilities, and is an active participant in class. This was a long survey, and while this student did not report high Linguistic MI, the entire survey was finished and free time between questions was spent on drawing doodles and initials across the first two pages. There are no areas of great concern in this individual profile, but it would probably be beneficial to have a conversation with this student about reading and writing, how they prefer to get instructions, and work on Intrapersonal skills (based on their answers to questions 99 and 104) surrounding feelings and managing emotions.

5.1.3.2 Participant Four

![Figure 8: MI Survey Results from participant #4](image)

**Figure 8: MI Survey Results from participant #4**
Participant #4 is a definite outlier. All pages on the survey have some questions answered, but only 24 of 39 were marked with a response. There was no one MI category with no answers, but a note from the survey collection before they were randomly numbered says this student spent approximately half of the survey ducking under desks and crawling on the floor. There are several questions where participant #4 erased a previous answer and put a new, larger mark somewhere else. There is no indication of whether the student did not understand the questions being asked, or had no opinion on an answer, or wasn’t listening at the time of the explanations.

This participant is well below the class average on survey results in all categories, with the exception of Naturalistic MI, which was scored at 2 points above the average. This is also the only participant who marked entire categories at a value of 0, and it is probable that the classroom teacher already knows a lot about this student based on observable behaviors like crawling under desks.

Overall, this is a student that would probably benefit from conversations about how they are doing, and what they would like to see in the classroom, as the survey indicated they may be having a difficult time engaging in classroom activities. This is a student under 10 who reports that no interest or skill in anything revolving around music, movement, reading, math, puzzles, social activities, or self-regulation. This may be a student who needs support in building self-confidence, and/or academic support if they truly don’t connect well with any of the listed MI. Lastly, this student appears to be very interested in, and/or motivated by nature and the natural world. A method of increasing academic interest, skills, and classroom engagement might be providing a variety of classroom books about animals and natural processes, selecting writing, vocabulary, or math problem topics that relate to these interests, sitting this student next to someone they work with very well, and spending additional time outdoors or in areas with natural light and a good view.
5.1.3.3 Participant Fourteen

![Bar chart showing MI survey results for participant #14 and average.]

Figure 9: MI Survey Results from participant #14

Participant #14 is also an outlier, reporting 5 of 8 MI categories at a full score of 20. Two other participants reported 2 categories with a full score, but this survey was the highest overall with a total score of 146. All MI categories had an above average score, with the exception of Intrapersonal (average) and Naturalistic (1 point below average). This student had some doodling across the 1st and 3rd pages, but no other notes.

Overall, this is a student who appears to enjoy school subjects, and may not have strong preferences between instruction methods. This participant seems self-confident, and probably does well in most subjects and on tests. It might be advisable to work with this student on independent tasks and self-management (Intrapersonal MI), and make sure that there are varied learning opportunities if class work is finished early.

5.1.4 Findings by compulsory subjects of the National Curriculum

The National Curriculum was analyzed both for overall themes, and using the MI framework to look at the competence markers and assessment criteria for grade four. The National Compulsory Curriculum of
Iceland is a public document that describes the goals and purpose of education, as well as expected teaching methods, assessment criteria, and mastered skills in grades four, seven, and ten. Analysis started with research question 3: How do these MI of the case study classroom compare with Iceland’s curriculum goals? Goals were considered both as the overarching goals and outcomes for students after compulsory education, and as individual goals for teaching and learning by subject area.

Data collected from documents can be used in the same ways as qualitative data from interviews or observations (Merriam, 1998), and an analysis of the written curriculum compared to what is happening in the classroom (observations), gives the best overall picture of the curriculum students experience.

The competence criteria for subject areas, Icelandic, Arts, Science, Physical Education, Social Studies, Mathematics, and Technology, were also sorted into the 8 MI categories. A discussion of those themes and findings follows in sections 5.1.4.1 through 5.1.5.

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Table 3: Competence markers outlined by the national curriculum sorted into MI categories. The highest occurring MI in each subject area is in bold.
5.1.4.1 Icelandic

Expectations for instruction, competence markers, and assessment of Icelandic language studies are described over 27 pages in the national curriculum. Language is described in great detail as a “principle foundation” (p. 97) of education; this includes reading, and personal expression including oral and written language. The purpose of teaching Icelandic as a mother tongue in schools is both to promote literacy, and to enable the population to express themselves and be creative orally and in writing. In this way people are well prepared to become active and fulfilled citizens, and Icelandic culture is passed through generations.

Icelandic language competence goals were divided into 4 categories, spoken language, listening and observing; reading and literature; writing; and grammar (p. 117). These are all literacy focused criteria, and indeed, the individual competence criteria markers expected for grade 4 students are 53% literacy based. Students are expected to have reached markers including fluent reading, reading for pleasure, and a desire to read their own work aloud or let others read it. 18% of competence criteria were Logical/Mathematical based, and include recognizing the purpose of learning grammar, the ability to file alphabetically, and deciphering symbols and simple figures. The only other significant contributor in the Icelandic section was Interpersonal MI at 16%. Students are expected to write their own material, choose texts based on their individual preferences, and express and defend their own opinions on written work.

The Interpersonal MI did not contribute to any competences within the Icelandic chapter, and that was a surprising finding that is not reflected in classroom practice. Individual reading activities do not utilize social skills, but the literacy stations in the observation classroom sometimes called for interaction and discussion, and students nearly always had the option to work in a small group if they preferred. Students also reported in their MI surveys that social interaction and friends were very important to them, and highly motivating.

5.1.4.2 Arts and Crafts

This section was 29 pages of the National Curriculum, and is divided into Dance, Dramatic Arts, Visual Arts, Music, Crafts, Home Economics, and Textiles. These skills are described as a natural form of human expression, cultural literacy, and education for sustainability. “The main objective of arts and crafts in compulsory schools is for every student to get acquainted with a variety of work methods that involve craftsmanship, creativity, the
integration of intellect and feelings and a number of different forms of expression” (pg. 144). This is consistent with the curriculum’s overall focus on general development for lifelong learning. Within this chapter, instruction is to be based on cooperation, abstract thinking, and self expression, and competences were dominated by Linguistic, Logical/Mathematical, Interpersonal, and Bodily/Kinesthetic MI, accounting for 78% of the 75 grade 4 competence markers. This was very consistent, with the exception of literacy, to what the curriculum described as the functions of the arts and crafts sections, including “physical literacy and intelligence” (pg. 147), the opportunity to problem solve creatively, develop personal taste and expression, and take on social and cultural issues creatively. Literacy was a surprising contributor in this section, because there were many specific examples given as to why words are not an effective medium of communication for these subjects. Much more emphasis is placed on physical, social, and individual development because “Through art people are able to express and enrich their feelings and acquire understanding and experience that cannot be expressed in words” (pg.146). This makes literacy a poor method of competence and assessment, but it gets nearly a full quarter of the grade 4 competence markers.

It was also surprising to find that Visual/Spatial and Musical MI came in at only 4% and 7% respectively, especially considering 6 of the 7 subsections listed above should easily utilize one or both of the musical or visual/spatial MI. This is another discrepancy in this chapter between teaching and students, and assessment outcomes. If students are learning through Visual/Spatial MI to crate Visual/Spatial material, and are assessed as competent through literacy, an argument could be made that they are not being assessed on what they have learned.

5.1.4.3 Natural Science

The natural sciences chapter of the National Curriculum describes competence as a combination of knowledge, skills, and specific attitudes towards the environment, nature, society, and technology, with the goal of students becoming scientifically literate. Instruction should be based on practices that develop action competence, allowing students to participate, critically analyze, and relate to the subjects on a personal level. The competence criteria are divided into 5 categories and 5 themes that focus on nature, science, technology, society, and action competence.

In this chapter Logical/Mathematical, Linguistic, and Naturalistic MI make up 82% of the grade 4 competences. These are a good match to the
subject area, with competences and assessment focused on critical analysis, indoor and outdoor studying, and the ethical factors inherent in individuals, society, nature, and technology. There are also 2 competences that specifically contribute towards action competence, with students taking initiative in getting information to analyze, and getting the opportunity to select tasks and present their findings. Linguistic MI again plays a strong role in assessing competence in the natural sciences chapter, with classroom discussions, explaining a concept, and writing texts the dominant achievement markers. Visual/Spatial and Interpersonal MI contribute to a total of 4 and 3 competences respectively, and include using satellite photographs to describe the local community, listening and discussing the ideas of others, and recording events or observations with photographs or examples. Assessment criteria in this chapter focus on Logical/Mathematical skills, 5/11 criteria, including finding solutions or designing a product, and drawing conclusions from data.

A strong focus in the text of this chapter was the connection between society, nature, and the individual, and technology, with a focus on teaching methods that lead to students understanding their own role in the study of natural sciences, and taking responsibility for further education. This should involve the school building and equipment, school grounds, and the surrounding area for students to observe, do practical and/or group work, and have discussions. These ideas are present and fairly specific in the text of the natural sciences chapter, but are not given emphasis in the competence or assessment criteria.

5.1.4.4 Physical Education

Chapter 23: Physical education, lists many reasons why exercise is necessary in school, including individual’s lifelong welfare, better school performance, learning one’s own body and it’s possibilities, and improved self-confidence. Exercise is described as “vital for all children” (pg. 187), and an excellent format for teaching democratic practices and goal setting. The text describing the role of physical education includes 7 of the 8 MI considered by this research, and emphasizes students using their individual strengths to increase positive self-image.

At the same time, Physical Education had the second lowest number of competence criteria at 27. These were divided almost exclusively into Bodily/Kinesthetic MI (44%), Intrapersonal MI (26%), and Linguistic MI (15%). Although music was mentioned in the purpose and descriptions of this chapter, it is not part of the competence or assessment criteria. Beyond the most obviously applicable MI (Bodily/Kinesthetic) there was
also particular emphasis in this chapter on Intrapersonal development. Physical education is described as one of the best ways to teach productive and respectful competition, respect and tolerance for others, self-evaluation, social, emotional and moral development, and independence. Grade 4 is also the year that students are expected to have mastered basic swimming strokes, safety, and independence enough to have unescorted access to local swimming pools.

Assessment for this subject area is inherently difficult because factors involving morals, social skills, feeling and initiative “can hardly be assessed, except subjectively” (pg. 196). In the case of physical education, assessment is instead intended to help students identify their own strengths and weaknesses, set goals, and promote positive self-image and future health and wellbeing. The actual criteria for assessment reflect a more standardized approach, with mastery of swimming styles and age appropriate physical fitness, sportsmanship and first aid, and the ability to describe sport and safety rules.

In the classroom observations, Bodily/Kinesthetic activities were well represented, with recorded instances as the second most common seen, after Linguistic MI. Students have 2 outdoor recess sessions per day for a total of up to 90 minutes. In addition, they have 2 physical education classes and swimming class each week, a total of 3 hours and 20 minutes. Art, cooking, and woodshop classes can also involve significant movement and coordination, and the setup and environment of the observation classroom allowed students to move and position themselves at will. In during free time, students were recorded using play-dough, beading, wrestling, crawling on the floor, and asking for additional recess time. Although students seemed, both through observation and their MI surveys, to want more opportunities for Bodily/Kinesthetic engagement, it was one of the most well represented MI in the observation classroom and school.

5.1.4.5 Social Studies

Social studies was another chapter with a strong focus on democracy, equality, and individual competence development. The 3 educational values of social studies were described in the National Curriculum as the competence of students to understand reality, understand themselves, and form and develop relationships. These all fall under Intrapersonal and Interpersonal MI, and these MI, along with Logical/Mathematical, made up the bulk of the text of the purpose and instruction of social studies.

In some contrast, the competence criteria for this chapter were largely Logical/Mathematical and Linguistic, at 35% and 29% respectively. These
criteria involved finding examples of studied phenomena, reflecting on the validity of information, describing what has been learned, and describing traditions or gender roles. These MI were fairly closely followed by Intrapersonal MI at 19%, with competence markers at grade 4 expecting that students can understand their own feeling, respect different views and lifestyles, discuss social and ethical issues, and talk about themselves.

Social studies lessons were not observed in the observation classroom, but evidence of past projects could be seen in the room and displayed in the school hallways. Projects included group posters from studying local mountains, coloring and found art projects showing local beaches, and the classroom rules contract made by the students. These were all projects displayed in a Visual/Spatial format, but this MI only accounted for 2 of the National Curriculum competence criteria, and none of the assessment criteria.

5.1.4.6 Mathematics

The mathematics chapter of the National Curriculum describes math as significant part of modern and historical culture, and that the objectives of teaching it in a modern context include discovery, creativity, expression and explanation of laws and patterns. This is a broad purpose for mathematics, and made broader by its links to sustainability and causation. In terms of instruction, math is to be taught with a focus of making meaning from math, respecting students ideas, and opportunities to reflect on the relevance of mathematics on students everyday lives. This involves incorporating math into many subject areas for measurement, critical analysis, coding, information sorting and processing, reasoning, and problem solving.

In terms of the competence criteria, Logical/Mathematical MI predictable dominated, accounting for 53% of criteria. This included using appropriate formulas and tools, interpreting and using symbols, solving math problems, proposing hypothesis, and using and calculating with natural numbers. The next most prevalent MI were Linguistic and Visual/Spatial, with 18% and 14% respectively. This was the most prevalent instance of Visual/Spatial MI in the competence criteria, but in the observation classroom, Linguistic and Intrapersonal were most often used by the classroom teacher, and Interpersonal by the students. In other words, the format for mathematics instruction was based on students independently completing their assigned math pages, and raising their hands if they needed the teacher to explain something. Every student almost always spent some of the math period working with a partner or
small group, and students were more likely to pick a group math game than an independent activity after their assigned pages were complete.

Bodily/Kinesthetic and Intrapersonal MI both get a notation in this subject area as well. The observation classroom had abacuses, number charts, and calculators on hand for students to work with. They were also allowed to count on their fingers or use manipulatives at will. While the lessons were set up as independent work, students could move to find a work partner, sit on the floor or in the hall, and had free choice of math activities after completing assigned work pages. Students who worked well independently were quickly finished and moved on to supplemental math activities each day.

The assessment description for mathematics was surprisingly broad, with the requirement that “diverse aspects” (pg. 227) of student’s math competence should be assessed. This included self and peer assessment, projects, portfolios, and research. This was not something observed in the observation classroom. Students completed pages from a workbook each day, and took the accompanying assessments and tests in the book. There is a portfolio at the end of the year for all subjects, and students are asked to select their favorite math pages and glue them in.

In contrast to the description, assessment criteria for mathematics listed criteria that were mostly Logical/Mathematical based, and standardized. They include using real numbers in calculations, using statistical and geometrical concepts, and looking at and discussing patterns. The exception to this was the first criteria, a student’s ability to express themselves competently in mathematical subject matter through proposing problems and solutions, and research and analyze with competence.

5.1.4.7 Information and Communication Technology

The last subject area of the National Curriculum was information and communication technology. This was a difficult subject to assess using MI because many of the concepts including media use, information technology, and computer use, are not easily categorized. Computer use could easily be sorted into Bodily/Kinesthetic and Visual/Spatial, for it’s keyboard and screen use, but that does not take into account the actual usage of the computer, or what students are getting out of the experience. As a result, many of the competence criteria were left uncategorized if they related to using technology, electronic study material, or had no specificity beyond becoming accustomed to technology.
Of the 17 competence criteria, 13 could be categorized, and result in only 4 MI, Linguistic at 38%, Intrapersonal at 31%, Visual/Spatial at 23%, and Logical/Mathematical at 8%.

The function of information and communication technology as a subject area is to increase information and media literacy, namely students’ abilities to find and analyze information, and use technology effectively. The curriculum goes on to describe technology and media as an excellent medium for differentiating learning needs, complex and long term projects, and for pupils to work on projects of their own design and interest. Assessment is also described as opportune for diversity, including writing, and sound, music or image processing.

In the observation classroom, technology was used to show children’s news videos during snack time, and in computer lab where student’s had a free choice of activities. Choices included action games, typing games and practice, coloring and art, music videos, children’s T.V. shows, physics games, and science videos.

5.1.5 Summary

Overall, the National Curriculum had very clear expectations for what students should be learning. Less clear were expectations for how students should learn in a way that contributes to the curriculum’s overall goals of a relevant and well rounded education, democratic practices, and getting students ready to become active citizens. An example of this is that mathematics should incorporate opportunities for students to practice and develop critical thinking skills, but there are no suggestions for what that would look like in the classroom, or how to make those opportunities when the assessment criteria for math instruction has very little to do with the daily math pages and written exams that students actually do in the classroom. This is given further consideration in the next section, Discussion.
6 Discussion

Children in this grade 4 Icelandic classroom have a variety of skills, interests, and intelligences that make instructing them complex. They are also very cooperative, listen well, can work independently, and have an excellent and supportive social dynamic. There are slightly more boys than girls, and seating layouts have groups of boys, mixed groups, and one group of girls. Students very consistently respond to instructions the first time they are given, and know the routine well enough to get ready for the next activity without being asked.

This is also a classroom with a notably relaxed atmosphere and high level of autonomy. Students choose who they want to work with and when, and are free to move about the classroom or rearrange furniture to meet their needs. There is very seldom silence, and math is the loudest lesson of the day, with students working in groups of two to five, and breaking apart to play games after they’ve finished.

Svandís, the classroom teacher, speaks in a quiet voice that students naturally hush to hear, and spends the majority of the day walking between desks to address questions. There were instances where as many as sixteen students had their hands raised to ask for clarification or help. Svandís finds that the majority of students do not fully understand unless they receive one-on-one instruction, and there just isn’t enough time for that.

Overall, classroom practices are a fairly good fit for student’s self reported MI. Armstrong advises that teachers should use a broad range of teaching strategies because “as long as instructors shift their intelligence emphasis from presentation to presentation, there will always be a time during the period or day when a student has his or her own most active intelligence(s) actively involved in learning” (2000). The case study classroom had a range of teaching strategies including literacy stations, instruction, and autonomous work, and on average, students and the classroom matched in prevalence of, and desire for, Linguistic and Logical/Mathematical practices. However, students, through their surveys and classroom observations, demonstrated a strong desire for more Visual/Spatial, Bodily/Kinesthetic, and Interpersonal instruction and assignments. These are students under 10, and they want more time to move, work together, and have visual cues or create visual products.
Armstrong notes that students may be able to “come up with strategies and demonstrate expertise in areas where teachers may be deficit” (2000), including drawing on the board to solve a math problem or suggesting windows/curtains open for a more comfortable environment. There is an excellent chance that students would learn more, and more effectively if they were given such opportunities.

The National Curriculum stipulates ways students should be instructed in each of the subject areas, and the overall goals of learning and school. These goals do not always have a clear presence in the classroom, and multiple teachers in the observation school expressed frustration that they are not able to meet all of these goals, and that they do not all reflect what teachers would like to see in the classroom. The National Curriculum is new, and training and information is still being implemented, but competence criteria and assessment methods did not always lead to the overall goals of differentiated instruction, democratic practices, and preparing students to be lifelong learners. A specific instance of this can be seen in the time disparity between students completing math assignments, further discussed in sections 5.1.2 and 6.2.1.

Additionally, there were no supplemental resources for teachers to learn more about how to bridge the gap between classroom and the curriculum, and they wanted help. For example, the classroom teacher designed literacy instruction in stations (5 groups rotating through 5 tasks) and it was an effective way to keep students engaged, moving around the classroom, taking responsibility for their own work and time, and cooperate as they wanted to. This widens literacy practices from instruction to engagement, something Armstrong (2000) concludes is on of the best ways to promote learning. In contrast, math instruction was based on solitary work in a workbook, and students waited to have one-on-one instruction when they needed help. This is a very traditional form of instruction that did not reflect the National Curriculum’s goals of mathematical literacy for problem solving and critical analysis, or democratic processes and work methods. There is no system or resource in place for teachers to share effective teaching methods, or get assistance.

Merriam (1998) outlines some of the issues in analyzing data from case studies with diverse data sets from observations, documents, and interviews, as was the case with this study. A consistent framework is needed to find significance and patterns (Merriam, 1998) and the Multiple Intelligences theory, with its set eight MI, was an applicable and effective tool for comparing curriculum, classroom practices, and student
preferences and behavior. In this study, having the MI framework focused analysis and allowed to concentrate on common and divisive factors, and look at the language used in written texts, and what was happening in the classroom. These are very different contexts for incoming information, and having a common framework that was already in line with teaching practices and curriculum allowed for a more in-depth case study. Using Howard Gardner’s MI, and possibly additional MI, could be applicable for other research projects looking at curriculum and the classroom, and teachers looking to assess their own classrooms and students.

6.1 Notes from the Researcher

This section covers notes and perceptions from the researcher over the course of the study.

6.1.1 View of the Classroom

The observation classroom is well organized, calm, and run by a veteran teacher who genuinely cares about her students. Students are arranged at nineteen individual tables that face forward, in groupings of one to three, and are almost always allowed to move tables or chairs to work anywhere they would like. They are also allowed to work standing, on the floor, or in other areas of the school. Students often choose not to work at their tables, either as whole groups or as individuals. This class demonstrated a high level of autonomy that I initially found surprising and Svandís, the classroom teacher, said that this is a group of students who work well with very little direction, and that they are one of the most hands-off groups she has had.

A third of the class regularly completes tasks such as math pages or reading station activities without direction or explanation, and the entire class has a calm and friendly social dynamic. They help each other, have very few disputes over materials or groups, and seem to enjoy coming to school. This dynamic, of enjoyment and cooperation, cannot be overstated. In my experience it’s a rare class that is so happy and relaxed at school, and I would have loved being in such a class as a child, and would do my best to make sure any child of mine had the opportunity to experience school that way.

6.1.2 Comparison of Two Systems

I went through elementary and highschool in a relatively liberal set of schools in the United States that focussed on projects, group work, and the
development of individual interests. By contrast, I taught in grade schools that were fairly traditional, with a strong focus on reading and math, and direct instruction. From this experience and that of the observation classroom, I want to make a couple of notes on the systematic differences in schooling from the U.S. and Iceland.

School in the U.S. covers less subjects (I do not know of any grade schools in the US that have woodshop, handicrafts, swimming lessons, or cooking) but it still manages to be much more hectic. There is a constant sense that there isn’t enough time in the day to get everything done, both as a student and teacher. I saw this difference very clearly during math instruction, where Icelandic students are expected to complete one or two pages from their workbook each day, over a period of 30-40 minutes. Students in the U.S. are expected to complete an average of 6 pages in the same amount of time.

There was very little direct instruction in the case study classroom. On the first day of observations, direct instruction accounted for a total of 12 minutes throughout the day: five minutes in woodshop, two explaining a test, and five explaining literacy stations. The majority of subjects contain no direct instruction at all, and that would be unheard of in any of the schools I had attended or taught at in the U.S. An average math lesson of 50 minutes would involve 10-15 minutes of instruction and whole group examples, 5-10 minutes of commonly asked questions solved together on the board, and 10 minutes of reviewing answers and checking for comprehension. This approach centers on repetition, and direct instruction accounts for 25-35 minutes of the 50 minute lesson.

Overall, I was left with the impression that these are two schooling systems that are working toward the same goals with very different approaches. The basic function of both systems is to give students the skills they need to live a fulfilling life and become functional members of society, but everything else, from the schedule of the day and subject areas, to the role of a teacher, reflects strong cultural differences. I can see strengths and weaknesses in both, and am left with a sense that everyone has more work to do in order to meet the needs of students better.
7 Conclusions

Going back to the research questions for this study, the three questions proposed were:

1) With which Multiple Intelligences do the case study students most strongly align?
2) What Multiple Intelligences are evident in the case study classroom practices, and to what extent?
3) How do these MI of the case study classroom compare with Iceland’s curriculum goals?

First, results of the study indicate that students in the case study classroom each had a unique MI alignment and no two students answered the survey the same way. Based on the survey averages for the class, students reported the highest skill/interest in Bodily/Kinesthetic, Naturalistic, Visual/Spatial, and Logical/Mathematics MI. The results of classroom observations showed that when students made choices on how to spend their free time, or how to accomplish a task, they utilized Bodily/Kinesthetic 31% of the time, Visual/Spatial 22% of the time, Interpersonal 16% of the time, and Intrapersonal 13% of the time.

For the second question, the case study classroom practices utilized each of the eight MI in the research framework, but not equally. Over the course of the 32 hours of observations, 79% of classroom time fell under Linguistic (22%), Bodily/Kinesthetic (21%), Intrapersonal (18%), and Visual/Spatial (18%) MI. The rest of the MI are all under 10%, with Logical/Mathematical at 8%, Naturalistic at 6%, Interpersonal at 4%, and Musical at 3%. While Bodily/Kinesthetic and Visual/Spatial are a good fit for the student survey results, in the cases of Naturalistic and Interpersonal, this does not align well with student learning preferences.

Lastly, question three addresses the comparison between the classroom and curriculum. The National Compulsory Curriculum of Iceland had goals for students that revolved around democratic practices, learning as preparation to be a productive member of society, a well rounded and relevant education, and health and development for life. The competence criteria for each subject area in grade 4 detailed specific skills students should be able to master. Those criteria fell overwhelmingly under Logical/Mathematics and Linguistic MI, which accounted for 57% of all competence markers. The next closest MI were Intrapersonal and Bodily/Kinesthetic at 14% and 8% respectively. With this in mind, the practices of the case study classroom, which are supposed to be based on
student mastery of competence criteria, did not always contribute to the overall curriculum goals. This was particularly evident in math instruction, where the assigned math pages and instruction methods did not lead to the curriculum goals of the subject being taught with a focus of making meaning from math, respecting students ideas, and students working confidently and autonomously.

Overall, this study collected a large amount of data in very diverse forms, from observations to documentary evidence. Gardner’s Multiple Intelligences theory made this comparison effective by organizing such different kinds of data in the same way, and narrowing the focus of the study. This gave a clearer overall picture of what factors contribute to what is actually happening in the case study classroom, and what curriculum looks like in practice.
8 Further Study

There are many options for further studies on this project, and related topics. A continuation of this project could be following up with these students and assessing participation and academic achievement, with the goal of making specific recommendations for individual students. A study could also be made of all the grade 4 students in Reykjavík to see what is happening in all schools.

I would be very interested in following this study with research on teacher resources, training, and satisfaction with the National Curriculum. Each school and teacher will implement this curriculum in slightly different ways, but teachers expressed a need for more resources and research about implementing curriculum in the classroom. I think this is a gap in current research, and it could have an immediate and positive effect on teachers and students in the community, and be used as a resource for educators and policy makers in a local, national, and global context.
9 References


Appendix

Part of the significance of this research was in its practicality and applicability. In addition, the observation classroom teacher requested recommendations at the conclusion of this project. In an effort to look at how classroom learning opportunities could more closely align with the learning styles of the case study students, recommendations for three subject areas are outlined. Recommendations for the written curriculum is also briefly discussed, both as a follow up to the teacher and principal interviews, and in an effort to bring attention to ways in which teachers could be used as a resource for the written curriculum.

Recommendations for the Case Study Classroom

Recommendations from this study are two-fold, and based on observations of students and their survey responses, and the opportunities that the curriculum, on both a national and local level, afford students.

At the classroom level, recommendations are made to incorporate more MI in lessons, meet the demonstrated MI needs of students, and follow curriculum guidelines.

Please note that these recommendations are classroom specific, but still require individualization for the classroom and individuals. Recommendations are not what should be done, but a suggestion for what could be done. For example, the first recommendation for math instruction is solving an equation together on the board. It is up to the classroom teacher to decide which question to do, how much to write, if another example is needed, and if everyone should participate. Options for individualization include color-coding components and solutions, students writing on the board instead of the teacher, and each student solving the problem on scrap paper then giving a rank from one to five fingers of how comfortable they were completing the problem.

Math Instruction

Math instruction is conducted in traditional cultural format where students receive instruction from the teacher at the start of each chapter, then complete the assigned page for the day and each day after independently. This is in keeping with the national guidelines of the Compulsory Curriculum of Iceland, that students work autonomously and confidently on math. Students are allowed to work in small groups or alone, and a third of the class routinely finishes the math page with enough time
to start elective math games or activity books. The students who do not finish in time, or use the entire 30-40 are consistently the same. During this time, students can wait 6-8 minutes each time they have a question before it is answered by the teacher, and that’s time not spent on math, especially considering some students have 3 or more questions each day. Incorporating more visual/spatial and linguistic MI in lessons may address these issues, as students’ self-report high linguistic competence and interest, and ask for more visual/spatial options.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Recommended Activity</th>
<th>Rationale</th>
<th>MI Utilized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students without a strong L/M inclination have more questions and difficulty completing math lesson on time</td>
<td>Solve first question together, and draw/write it on the board</td>
<td>Students transition into math, remember the last lesson, hear and see instructions in addition to reading them</td>
<td>L, V/S, Intra, L/M</td>
</tr>
<tr>
<td>Students wait a long time to have questions answered</td>
<td>Answer some questions together on the board.</td>
<td>Some students may have the same question, or answer their own question by watching or helping another student solve one. This reduces waiting time to answer questions.</td>
<td>L, V/S, Intra, L/M, Inter</td>
</tr>
<tr>
<td>Math tasks are not a challenge for all students</td>
<td>Have students who are finished early make 1-2 of their own equations or examples based on the lesson, alone or in a small group</td>
<td>Double check comprehension, increase student’s competence and confidence in math.</td>
<td>L/M, Intra, Inter</td>
</tr>
<tr>
<td>Comprehension must be checked one on one, and there isn’t enough time to work with</td>
<td>Solve 2-5 of the student’s equations in the last 5 minutes of the lesson.</td>
<td>Check the entire class’s comprehension, involve students in the teaching process, increase relatability and interest in math, follow up on the</td>
<td>L/M, V/S, Intra, L</td>
</tr>
</tbody>
</table>
everyone lesson, allows additional practice for students who have not completed the lesson

**Table 4: Recommendations for Math Instruction**

**Literacy Instruction**

Literacy practices are a substantial part of instruction and activities in the classroom, and this is consistent with the format of compulsory school. The observation class also has specific practices that address the national curriculum's expectations for Icelandic, spoken language, listening and observing; reading and literature; writing; and grammar. Several times each week the observation class broke into small groups to do literacy stations. Activities included writing a postcard, decoding words from numbers, reading a printed page aloud, examples of grammatical rules, and finding words in a word search. Students rotated through these activities over the course of an hour. Recommendations are made to incorporate additional goals from the National Curriculum regarding literacy, writing

<table>
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<tr>
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<th>Rationale</th>
<th>MI Utilized</th>
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<tbody>
<tr>
<td>Lack of personal connection in literacy activities</td>
<td>Incorporate larger projects to be finished every two weeks. (Send postcards to retirement homes and read replies, write a one page story and illustrate it, review a book or poem, make a class book, etc.)</td>
<td>Personal responsibility, concrete contribution to class and literacy practices, literacy practices have increased relevance to students, incorporation into classroom and larger community</td>
<td>L, varied based on task</td>
</tr>
<tr>
<td>Students do not explore genres and/or see the applicability of reading for hobbies and</td>
<td>Read aloud as part of the daily routine. Discussions and questions on book.</td>
<td>Increased fluency and interest, and a model of rhythm and cadence for struggling readers.</td>
<td>L, Intra, L/M, Inter, varied based on</td>
</tr>
</tbody>
</table>

74
and Icelandic.

Table 5: Recommendations for Literacy Instruction

**Computer Use**

Students are still getting used to the computer lab, and spend up to two periods per week making free choices to draw, solve logic puzzles, play adventure games, watch children's videos from RUV, listening to music, and doing word searches. They each have a computer and a set of headphones and talk to each other about the things they are watching or doing. The teacher walks around the room putting in websites on request and helping with applications. Recommendations are made to increase student autonomy and competence with computer functions, and incorporate computers into regular classroom practices.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Recommended Activity</th>
<th>Rationale</th>
<th>MI Utilized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students do not critically reflect on reading, and do not have the opportunity to share what they have learned/read</td>
<td>Students review books they've read, take a photo and write a paragraph with or without help. Put reviews into a class book and class/school website. Students read reviews to class.</td>
<td>Personal responsibility, concrete personal contribution to class and literacy practices, literacy practices have increased relevance to students, incorporation into classroom and school community, connection to home.</td>
<td>L, Intra, L/M,</td>
</tr>
<tr>
<td>Struggling readers do not develop an interest in books and reading</td>
<td>Provide audiobooks, headphones, and paper copies of books for classroom.</td>
<td>Model fluency and cadence of reading, allows students to read more difficult books, expands reading options for struggling or disinterested readers</td>
<td>L</td>
</tr>
</tbody>
</table>

and Icelandic.
and autonomy websites as necessary. themselves. Less waiting time, and higher self-sufficiency.

Computers have limited use and applicability for students and the classroom Use computer lab for classroom projects, including book reviews, researching new books, math tutorials, student made word searches, etc.
Demonstrate relevance of computers in school, incorporate technology into lessons.

Inter, L/M, V/S, L

Table 6: Recommendations for Computer Use

Recommendations for Policy Makers

Based on this study, some recommendations can be made to the Ministry of Education, Science and Culture. These recommendations arise from teacher feedback, observations, and the comparison between classroom practices and the National Curriculum.

Teachers need support in making this transition to incorporating the new curriculum into classrooms. Many teachers at the study school expressed frustration that they were left to make this transition on their own. There have been training sessions at the school to familiarize staff with the curriculum, but no one at this school said it was enough. The curriculum is currently a large book that does not relate to classroom practice, and teachers don’t know how to bridge the gap between what they would like to do and what they can do. Teachers would like:

1. Concrete examples of what the new curriculum looks like in practice, including example lesson plans, daily schedules, and grading standards
2. Training and resources to transition into expected teaching and assessment practices
3. Acknowledgement of what goals and guidelines are already being practiced, so that the focus shifts to what is left, and how to make those changes with individualized support

Teachers and schools need resources. Teachers feel they already do not have the resources to completely meet the needs of their students. As a
result, they do not see a feasible way to meet all the new guidelines and provide students with the kind of education described in the national curriculum.

The last suggestion, but by no means the least important, is to use teachers as the resource they are. Teachers spend time with students every day, and form relationships with families in the community. They are an underutilized resource for what correct practices are, and what could and should be. None of the staff in this study felt they had any input on the new curriculum, but they wanted to, and felt many issues with lack of clarity and implementation would be solved if policy reflected the participation of educators at all levels.