Chapter 1: Introduction

1.1 Overview

Over the past two decades, information and communication technology (hereon ICT) has substantially influenced every aspect of our lives. ICT is a specific term that refers to technologies designed for collecting, processing, preserving, and delivering information (Elisha, 2006). Indeed, the use of ICT has changed the way people communicate, live, work, and of course learn. ICT is currently understood as an indispensable tool for participation in society, which has led educators and decision makers in a great number of countries to include ICT in the educational system (Xiao, Y., & Hu, J., 2019). In the Nordic countries for instance, ICT is now being recognized as one of the essential 21st skills, the Nordic countries compete to be best in class across the EU when it comes to provision of infrastructure in schools (European Commission, 2016). However, teachers, policy makers and parents are still raising controversial questions about the influence of ICT on students' achievement. This is evident in the myriad studies that either support or refute the claim that the use of ICT can contribute positively to students' achievement, this relationship between ICT and students' performance have been extensively researched for the academic domains including literature, mathematics and reading, it is still interesting how some studies find this relationship positive; others find negative or no correlation at all (Fariña et al., 2015). As for OECD conclusion about this relationship, in its ICT Framework OECD has mentioned that students' engagement with ICT - both in and outside of school - can affect their cognitive processes and their well-being, and

eventually what they learn (Adrien, L., 2021), makes this relationship worth studying.

One possible reason why these studies have contradictory results, can be traced to variables that mediate the relationship between ICT use and achievement. This study hypothesizes the mediation role of students' attitudes towards reading between their ICT use and achievement. Reading as one of PISA main domains was first defined as "students' ability to understand, use, reflect on and engage with written texts in order to achieve one's goals, develop one's knowledge and potential, and participate in society" (PISA, 2018)" is greatly influenced by ICT as the later has reshaped reading activities by engaging students in effective reading activities and improving their reading comprehension (Zhang, D., & Liu, L. 2016). As for background variables, (PISA, 2018) have concluded that students' SES is one of the background variables that is strongly correlated with reading performance.

This study will focus on data from PISA 2018, as it is the latest cycle, and its main focus is reading. Denmark, Sweden, and Finland will be the countries in question. These countries were chosen as they have the highest rates of individuals using the internet (World Bank, 2020), the strongest welfare and stable economies with focus on education (Social Progress Index, 2020) and on top on that, these countries are among those with the least gender gaps (The global Gender Gap Index, 2020) all the above factors refer to common grounds of the variables we will use in this study, namely, ICT, attitudes towards reading, gender, and social-economic status, which might eliminate or decrease potential bias.

1.2. The Importance of ICT

PISA defined ICT as "the use of any equipment or software for processing or transmitting digital information that performs diverse general functions, whose options can be specified or programmed by its user" (Organization for Cooperation and Development; OECD, 2005). Given its high relevance in everyday life, it has become critical to understand ICT's use on students' academic achievement. Due to living in an "increasingly digital environment, PISA has also been concerned with assessing the role of information and communication technology in students' lives.

Information and Communication Technology (ICT) is defined as a form of technology that stresses the role of communication, being also concerned with information storage and sharing (Odell, Gavlovan, Cutumisu 2020, p. 1). The Covid-19 pandemic has further elevated the role of technology in the lives of students. Much of the information previously provided in person, is now communicated through online platforms. Previously, ICT use was mostly used for leisure, but in the current days, it is used for education and schools. "Donald Leu et al. (2007, 37) describe this world as a 'digital, networked, multimodal, and multitasking world of information and communication' (Leino, 2014).

"ICT includes devices, applications, networks, and systems that enable connection to information and to others. What differentiates ICT from other forms of information technology is its focus on communication" (Odell, Gavlovan, Cutumisu 2020, p. 1). It is important to note that ICT literacy "is the interest, attitude and ability of individuals to appropriately use digital technology and communication tools to access, manage, integrate and evaluate information, construct new knowledge, and communicate with others in order to participate effectively in society" (OECD 2003/2005, 11). Therefore, to accurately evaluate the impact of ICT use on

education, one must thoroughly inspect each aspect. Among those critical aspects is how ICT may influence students' willingness to read, thus enhancing their reading achievement. By improving reading attitude, ICT use may elevate ones overall reading achievement.

1.3 Research Questions

This study will attempt to address the below issues:

1. The validity of ICT use (inside and outside school) as a construct in PISA?

2. To what extent the type and frequency of ICT use impact students reading performance?

3. To what extent students' attitudes towards reading mediate the relationship between ICT use and reading performance?

4. To what extent gender and ESCS impact reading performance?

5. What are the differences between Denmark, Finland and Sweden when answering the above?