

Exploring non-cognitive skills and inequality through the magnifying lens of a pandemic

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Summary

Successfully navigating the challenges of today's society requires a balance of cognitive and non-cognitive skills. Non-cognitive skills – also frequently referred to, amongst other things, as socioemotional skills, soft skills, or even personality traits – play a crucial role in many aspects of life, impacting education as well as later-life outcomes such as success in employment, interpersonal relationships, and general well-being. They are broadly defined as the patterns of thought, feelings, and behaviours of individuals that can be developed through formal and informal learning. Unlike cognitive skills that focus on intellectual abilities, non-cognitive skills encompass a diverse range of skills, including critical thinking, problem-solving, social skills, perseverance, and creativity.

This dissertation aims at obtaining a deeper understanding of the various ways in which non-cognitive skills impact student learning outcomes and gaining further insights into differences among students. In this context, this dissertation explores the multifaceted impacts of the Covid-19 pandemic on students, with a particular attention on the impact of the Covid-19 pandemic on non-cognitive skills, the relationship between non-cognitive skills and learning loss, and the effectiveness of summer schools. The different chapters shed light on the relationship between these variables while considering different educational levels, educational tracks, and socioeconomic backgrounds.

Chapter 2 establishes the impact of the Covid-19 pandemic on learning loss in language and math skills and its association with non-cognitive skills among primary education students. During the Covid-19 pandemic, education faced unprecedented physical school closures. These school closures and the remote learning that followed were associated with learning loss. Studies have already shown that the students' personality traits affected their ability to cope with this unexpected life-changing event. The present study goes a further, by investigating whether personality traits were also associated with learning loss in primary education. Using cross-sectional data from the *EducationMonitor Limburg*, including standardised tests in the domains of reading comprehension and math as well as personality traits. In this chapter the relationship between learning delays in language and math on the one hand, and personality traits on the other hand, is compared between the cohort of ninth-grade students before Covid-19 and the cohort of ninth-grade students since Covid-19. The findings show that students who experienced the Covid-19 pandemic suffered learning loss in both domains. For math, a relationship is indeed found between personality traits and learning loss. Specifically, students with low levels of conscientiousness and emotional stability experienced, on average, more learning loss in math.

Chapters 3 and 4 focus on non-cognitive skills, such as performance orientation and creativity, of students in secondary education. Chapter 3 examines whether changes occurred in non-cognitive skills during the early period of the Covid-19 pandemic. The analysis distinguishes between the different educational tracks, the pre-vocational education track (vmbo) and the pre-higher education tracks (havo and vwo). Cross-sectional data from the *EducationMonitor Limburg* is used for this purpose, comparing student questionnaires conducted in 2018 and March 2020 (both pre-Covid) with those conducted immediately following the initial school closure (June/July 2020) and at the onset of the subsequent academic year (September 2020). The findings showed that *pre-vocational education students* exhibited minimal differences in their non-cognitive skills, with lower levels of performance orientation reported only since the pandemic. Additionally, while their average score on perseverance

was lower just before the pandemic compared to the earlier cohort, it stabilised during the pandemic. Regarding creativity, the average score of pre-vocational education students immediately before the pandemic and just after the initial school closure was higher compared to the earlier cohort, but did not remain higher in the long term, that is, after the summer break. In contrast, *pre-higher education students* showed higher levels of non-cognitive skills in terms of school motivation, school attitude, self-efficacy, and social relations with teachers and peers immediately after the first school closure, but experienced decreased levels of non-cognitive skills in the longer term.

For students from lower socioeconomic backgrounds, non-cognitive skills are considered key to improved outcomes, both in education and in later life. Chapter 4 investigates whether the non-cognitive skills of secondary education students differ according to their socioeconomic background and whether these differences, if any, have changed since the Covid-19 pandemic. As in Chapter 3, the secondary education data from the *EducationMonitor Limburg* is used. The results indicate no differences in non-cognitive skills among students from diverse socioeconomic backgrounds, for the cohort since the pandemic. While some disparities existed within the cohort before Covid-19, particularly in the areas of creativity, critical thinking, problem-solving, and curiosity in favour of the higher socioeconomic groups, these differences dissolved rather than being exacerbated by the pandemic.

In the wake of the Covid-19 pandemic, summer schools have been viewed as potential interventions to address learning losses. Summer schools were originally introduced in the Netherlands in 2016 to provide additional educational support during the summer break, focusing on remedial instruction to aid students who encountered setbacks. Chapter 5 considers the impact of pre-pandemic summer schools by evaluating school administrative data for their effect on the average math performance of secondary education students. Additionally, this chapter assesses whether this effect differs according to socioeconomic background (SES groups: low, middle, high). The results indicate that participation in summer school does indeed produce an overall modest improvement in math: when analysing the SES groups separately, we observe a positive effect from participation for all three SES groups. However, the effect seems less pronounced for participants in the lowest and middle SES groups when compared to the highest SES group.

As a whole, the chapters in this dissertation provide valuable insights into the complex relationship between educational experiences, non-cognitive skills, and the effectiveness of possible interventions. They offer insights into the dynamics within primary and secondary education before and after the onset of the Covid-19 pandemic. Together, they illustrate disparities between individual students and student populations, as well as the varied impacts of unexpected life-changing events. This dissertation demonstrates that non-cognitive skills play a mediating role in learning outcomes although they vary across student populations. While there are no apparent differences in non-cognitive skills across different socioeconomic groups, the efficacy of interventions aimed at enhancing student performance does vary depending on socioeconomic background.