Utrecht University

Starting at the STEM:
Investigating Stakeholder Needs to Empower Primary School Students with a Second and Third-Generation Non-Western Migration Background Residing in Disadvantaged Neighbourhoods to Realise Their (Technical) Educational Potential

Zazie Franck (6760198)

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Utrecht University, Faculty of Social & Behavioural Sciences

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Thesis Supervisor: Dr. Joyce Endendijk (jjendendijk@uu.nl)
Second Reader: Dr. Semiha Bekir (s.y.bekir@uu.nl)

Abstract

English: Students with non-Western migration backgrounds and lower socioeconomic status are underrepresented in higher levels of Dutch education. This is known as the “Leaky Pipeline” problem. Through semi-structured interviews (n=14), this study assesses stakeholders’ (parents, schools, and municipal and civil society organisations) needs, as a first step toward an early intervention by TU Delft aimed at addressing this issue. The study argues for the need for alignment between stakeholders; critical reflection; supporting and leveraging existing networks; fostering families’ resilience, confidence, and social capital; (safe) spaces for students; improved information accessibility; positive role models; and reducing the gap between parents, teachers and STEM education and careers. Based on this, the study proposes several potential areas for intervention.

Dutch: Studenten met een niet-Westerse migratieachtergrond en lagere sociaaleconomische status zijn sterk ondervertegenwoordigd in de hogere niveaus van het Nederlands onderwijs. Dit staat bekend als het "Lekkende Pijplijn" probleem. Door middel van semigestructureerde interviews (n=14) inventariseert deze studie de behoeften van stakeholders (ouders, scholen en gemeentelijke en maatschappelijke organisaties), als aanzet tot een vroegtijdige interventie door de TU Delft om dit probleem aan te pakken. In het onderzoek wordt gepleit voor afstemming tussen belanghebbenden; kritische reflectie; het ondersteunen en benutten van bestaande netwerken; het bevorderen van de veerkracht, vertrouwen en sociaal kapitaal van gezinnen; (veilige) plekken voor leerlingen; toegankelijkere informatie; positieve rolmodellen; en het verkleinen van de kloof tussen ouders, leerkrachten en bèta/technisch onderwijs en carrières. Op basis hiervan worden in het onderzoek verschillende mogelijke interventiegebieden voorgesteld.

Key-words: *Widening Participation, Non-Western Migration Backgrounds, Low Socioeconomic Status, STEM, Leaky Pipeline*

Table of Contents

1. Introduction......4
1.1. Context & Background......4
Recent Migration......4
The Dutch Education System......5
1.2. Study Purpose......6
The Leaky Pipeline Problem......7
2. Theoretical Framework......10
2.1. Key Concepts......10
2.2. Conceptual Frameworks......12
Situated Expectancy-Value Theory (SEVT)......12
Motivational Accounts of the Vicious Cycle of Social Status Framework......13
3. Methodology......14
3.1. Inclusion Criteria......14
3.2. Sampling......14
3.3. Interviews......15
3.4. Data Analysis......16
4. Results......17
4.1. Parental Educational Involvement......17
4.2. Parent-Teacher/School Relations......17
Social Engagement......17
Conceptions of Child-Rearing......18
Prejudice and Reflexivity......19
4.3. Networks......20
4.4. (Safe) Spaces......21
4.5. Role Models......21
Positive Role models......22
Negative Role models......22
4.6. Children’s Experiences of School......23
Racism and Social Development......23
Intellectual Development......23
4.7. Abstract Nature of Technical Studies......24
4.8. Conceptions of Success......24
5. Discussion......26
5.1. Main Findings......26
Stakeholder Needs......26
1. Need for Alignment Between Stakeholders (Parents, Teachers, Organisations) and Positionality......26

2. Need for Networks... 27
3. Fostering Resilience, Confidence, and Social Capital..27
4. Need for (safe) Spaces...28
5. Need for (Positive) Role Models...28
6. Reducing the gap between parents, teachers and STEM.......................................28
Sub-Questions..29
Parents' and Teachers' Expectations of Students' Aspirations.................................. 29
(Lacking) Support for Students, Parents, and Teachers... 30
5.2. Implications and Recommendations...30
Rethinking Outreach.. 30
Extra-Curricular STEM Programs.. 31
Tutoring Scheme & Classroom Help.. 31
5.3. Limitations...31
6. Conclusion...33

1. Introduction

1.1. Context & Background

Recent Migration

Between 1964 and 1973, the Dutch Government, facing a shortage of low-skilled labour, entered into labour migration agreements with Türkiye and Morocco (Crul & Doomernik, 2003). Most recruited workers were of lower socioeconomic status (SES) in their home countries and generally had lower educational attainment. Only 15-20 years later, many lost their employment due to industrial restructuring. Due to the planned short-term nature of the labour scheme, the integration of Turkish and Moroccan immigrants into Dutch society was given insufficient focus (Crul & Doomernik, 2003). However, the workers stayed and, through a family reunification scheme, many of their friends and family followed. Nowadays, people of Turkish and Moroccan background are two of the four largest non-Western minority groups in the Netherlands (*CBS, 2016*). Their lower SES, the abrupt termination of the opportunities that drew them to the Netherlands, and the lack of initiative to work on integration meant that the first wave of Turkish and Moroccan migrants began their 'Dutch experience' at a disadvantage.

Guest workers' second and third-generation descendants are now navigating the still deeply unequal Dutch education system and job market. Youth with a non-Western migration background are starkly underrepresented in pre-university secondary education and universities (more on that in the next section) (Andersson et al., 2023; Crul & Lelie, 2020; *CBS, 2023*). On average, youth with a migration background are on the lower end of income distribution in comparison to Dutch youth with no migration background (Elke et al., 2019). This disparity is especially large for youth of Turkish and Moroccan descent.

The Dutch Education System

The Dutch education system uses early tracking where students graduating primary school are sorted into different secondary education learning levels based on a combination of teachers' advice and a national examination commonly referred to as the Cito-toets (Crul, 2018). There are six different tracks, two of which lead to higher education and four of which lead to more vocational education. This early tracking plays a significant role in defining futures as it determines whether or not students will have the chance to proceed to higher education without barriers such as bridging programs (Crul, 2018).

Although this structure has certain benefits, it has significant potential for discrimination and benefits those who fit the particular learning and socioecological profiles to which the Dutch education system is tailored (Hermann Dino Steinmetz, 2019). The early tracking system is based on the expectation that enough is known about a child by age 12 to determine their educational potential. In part, due to differing experiences and circumstances, this is more challenging for some. For example, in primary school, there is often a significant gap between the level of Dutch language skills of children with no migration background and those with a non-Western migration background (Hermann Dino Steinmetz, 2019). By the time of the Cito-toets, of which a large portion tests for language skills, this gap is not fully closed. Moreover, students with a non-Western migration background often face more emotional, psychological, cultural, and social adaptation difficulties (Hermann Dino Steinmetz, 2019). This commonly leads to antisocial behaviour that is seen by the teacher as being a 'bad' student rather than a product of a complex identity within a society that does not treat it kindly (Hermann Dino Steinmetz, 2019). In turn, this can shape teachers' advice for what level of secondary education best suits the child.

Parents are key figures in their children's educational journeys (Rodrigues et al., 2018). In the Dutch system, parents play a large role in advocating for their children; it is not uncommon for teachers to change recommendations under parental pressure (Crul, 2018). Moreover, parents help choose what secondary school their child goes to. This is particularly important as some schools offer more bridging programs and possibilities to move to higher levels than others. Unfortunately this requires a significant

amount of knowledge and confidence vis-à-vis the educational system—something that parents with a non-Western migration background are less likely to have (Crul, 2018).

Students with a non-Western migration background often live at the intersection of lower SES and parental educational achievement (Hermann Dino Steinmetz, 2019). This intersectionality takes on a further geographic component as the schools these students generally attend do not have the resources to properly address the wider issues the students face. Inequalities, if not addressed, perpetuate a harmful cycle of deprivation as educational disadvantages have downstream repercussions for employment and social mobility. Unemployment rates one year post-graduation for students with a non-Western migration background stand at 23% compared to 14% for those with no migration background (Hermann Dino Steinmetz, 2019). This disparity underlines the importance of an equity-based intervention to tackle structural inequalities and ensure access to higher education for all those who wish to attend.

1.2. Study Purpose

This study serves as the foundation for one such intervention. The Technical University of Delft's (TU Delft) outreach program in primary schools looks to begin piloting in 2025. The program is aimed at helping raise the aspirations of second-generation immigrant children with a low SES and to foster students' interest in STEM subjects. Through widening participation, TU Delft looks to address inequalities in primary schools at as early a stage as possible, ensuring that everyone is equipped and adequately supported to realise their educational aspirations. As a first step in this program, in this study, I explore the needs of the different stakeholders that play a role in supporting children with a non-Western migration background residing in disadvantaged neighbourhoods in their education—both directly and indirectly—and identify possible areas for intervention. Consequently, I propose next steps to ensure an effective widening participation outreach program. The study focuses on the Rotterdam area as a new TU Delft campus is set to open there.

The Leaky Pipeline Problem

First coined by Blickenstaff (2005), the 'Leaky Pipeline' originally described the progressive diminution of women in Science, Technology, Engineering and Mathematics (STEM) along their academic and professional pathways. A similar phenomenon occurs in the educational journey of youth with a migration background and lower SES. During the 2019/20 academic year, of all students in secondary education with a non-Western migration background, only 13% followed the VWO track compared to the 21% of students with no migration background (CBS, n.d.). Students with a Turkish or Moroccan migration background are clustered in the lower levels of the Dutch education system (see Figures).

Figure. 1: Representation of Turkish & Moroccan Migration Backgrounds in Education Levels

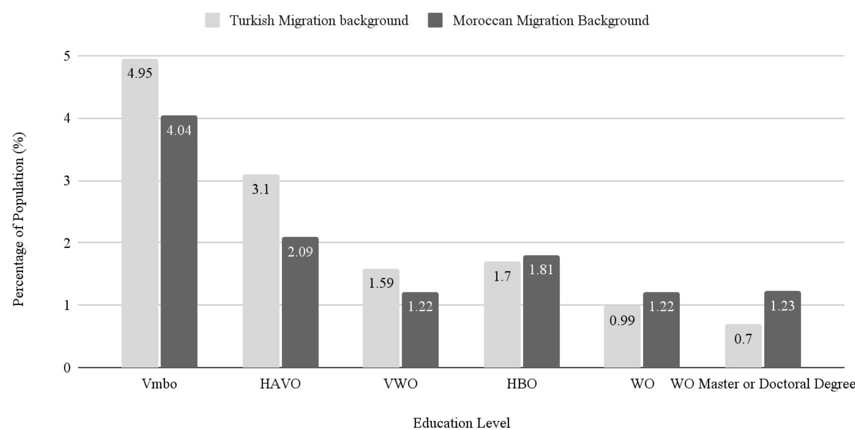
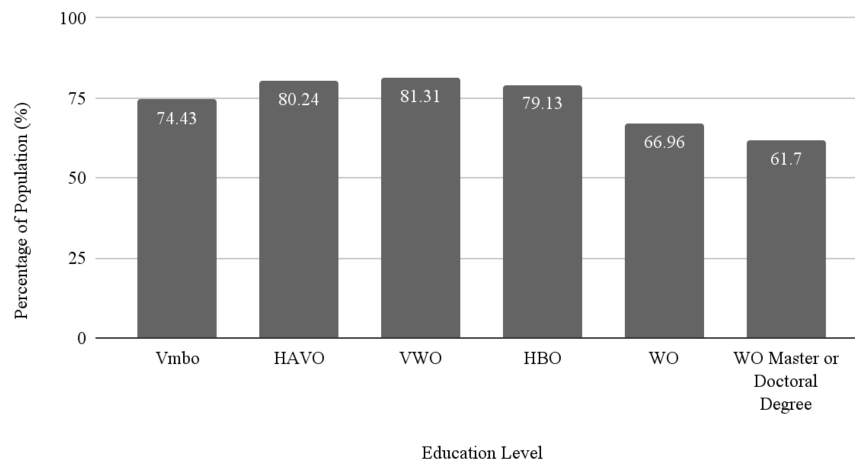


Figure. 2: Representation of Native Dutch in Education Levels.



VWO grants access to university-level studies. Though in the last five years, the number of students with a migration background who progress to higher education has increased, they are remain highly underrepresented (Bakker & Ransijn, 2023). To diversify the pool of students entering higher education, efforts must be directed at the early stages of the education system.

Starting early has numerous benefits. Flouri and Panourgia (2012) found that children from lower SES families with higher career aspirations tended to exhibit less antisocial externalising behaviour than those with lower aspirations. Other studies have shown how, in the Dutch context, interventions during primary school are effective in reducing educational disparities and can help develop essential skills foundational for future academic success (Crul, 2018). Early interventions help form aspirations and provide students the necessary support and guidance to achieve them.

Research-backed widening participation initiatives in alignment with higher education are new to the Netherlands. University efforts have mainly included developing materials for primary schools under the assumption that schools will reach out to receive them. Universities also tend to focus more on secondary schools. Erasmus University in Rotterdam is the first institution to implement a widening participation program for young children that includes schools, youth and communities in Rotterdam, starting in 2023. This outreach is backed by research and involves extensive data collection. Other than this program, all others are run either by individuals or small groups from the university and do not focus specifically on disadvantaged groups, or do not have a “structure” (timeline, stakeholder involvement, research, framework etc.). Certain initiatives like ‘Meet the Professor’, where university professors give a lesson in a primary school, have existed for a while but no long-term, planned, and monitored interventions have been implemented (to my knowledge).

There are multiple municipal and civil society initiatives specifically targeting areas where there are strong disparities. There is, however, no alignment with universities, nor is there meaningful inter-program coordination.

There has been little research into primary school outreach for widening participation in the Netherlands. Furthermore, the 'Leaky STEM Pipeline' is an under-explored phenomenon in the Dutch context and existing studies have mostly utilised a gendered lens. No research has been done specifically addressing the issue in relation to primary schools and through the intersectional lens of SES and migration background (Van Den Hurk et al., 2019; Vossen et al., 2023). This study constitutes a first step towards addressing this gap by exploring the question:

> *According to stakeholders, what are students' with a non-Western migration background (second and third-generation) who reside in disadvantaged neighbourhoods needs to realise their educational potential?*

As requested by TU Delft, the study also examines the following sub-questions:

1. *What are the expectations of parents and teachers for the aspirations of students?*
2. *What are the perceived barriers and facilitators to educational success according to different stakeholders?*
3. *How are they (students, parents and teachers) being supported (or not) and what are they missing?*
4. *How can higher education institutions reach the stakeholders to provide support?*
5. *How do students perceive their cultural capital?*
6. *What are student, teacher, and parent perceptions of (STEM) higher education?*

2. Theoretical Framework

2.1. Key Concepts

Educational aspirations – Idealistic values that reflect the educational attainment that one hopes and desires to achieve (Chen & Hesketh, 2021).

Low socioeconomic status – This concept generally refers to lower-income individuals or households and often also considers low educational achievement. Since low SES often also has a geographic dimension, I have chosen to determine low SES based on neighbourhood characteristics.

Disadvantaged neighbourhood/Neighbourhood of multiple deprivation – this study relies on the SES-WOA metric (Welvaart-, Opleiding- en Arbeidsscore) as a proxy for the more holistic concept of socioeconomic status to identify such neighbourhoods. The SES-WOA takes into account financial prosperity, education level and recent employment history (CBS, 2022). In addition to this metric, I considered percentage of households receiving government benefits and percentage of residents with a non-Western migration background,in line with other European indices of deprivation, to narrow down the study's scope to fit TU Delft's assignment (Consumer Data Research Centre, 2016; Longley et al., 2024). These factors are relevant as numerous studies have shown that growing up in a predominantly low-SES neighbourhood correlates with lower levels of educational attainment (Andersson et al., 2023). Furthermore, high concentrations of people with a non-Western migrant background in the Netherlands reside in socioeconomically disadvantaged neighbourhoods (Crul, 2018).

Non-Western migration background – I maintain the Central Bureau for Statistics' (CBS) definition which classifies these as "persons originating from a country in Africa, South America or Asia (excl. Indonesia and Japan) or from Turkey." (CBS, n.d.). I narrow this down to mean a person of whom at least one parent or grandparent was born abroad in a non-Western country.

Widening Participation – Efforts made to increase access to higher education by supporting students from underrepresented groups who face disadvantages due to personal circumstances (Younger et al., 2019).

Often, initiatives target people with low SES, first-generation students,or students with a migration background.

2.2. Conceptual Frameworks

The study relies on the two frameworks. Together, they constitute a holistic consideration of the contributing factors to academic and professional success taking into account personal and environmental determinants.

Situated Expectancy-Value Theory (SEVT)

Situated Expectancy Value Theory is an adapted version of expectancy value theory proposed by Eccels and Wigfield (Eccles & Wigfield, 2020). SEVT draws connections between internal and external factors, and, through this, sheds light on how personal experiences and other factors such as the cultural milieu can influence individual expectations, values, and behaviour. When applied to the experiences of students with a non-Western migration background residing in disadvantaged neighbourhoods, the model points to key events or interactions influenced by unique personal characteristics and the local context that shape achievement-related choices. These events and interactions informed the study's focus and interview design.

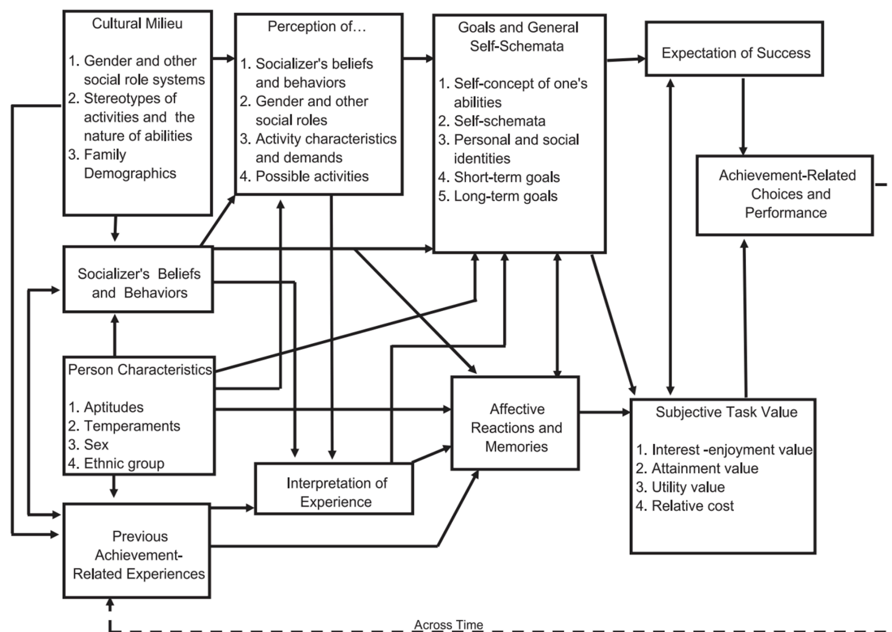


Figure 1. Situated Expectancy-Value Theory

Motivational Accounts of the Vicious Cycle of Social Status Framework

The Vicious Cycle of Social Status Framework introduced by Laurin et al. (2019) helps balance and make sense of the contrasting perspectives linking motivation to SES. The accounts within the wider Framework shed light on potential causes for low social mobility within a broader social system *(See Appendix A for full Framework)*. In turn, this has helped identify areas of focus for the research design.

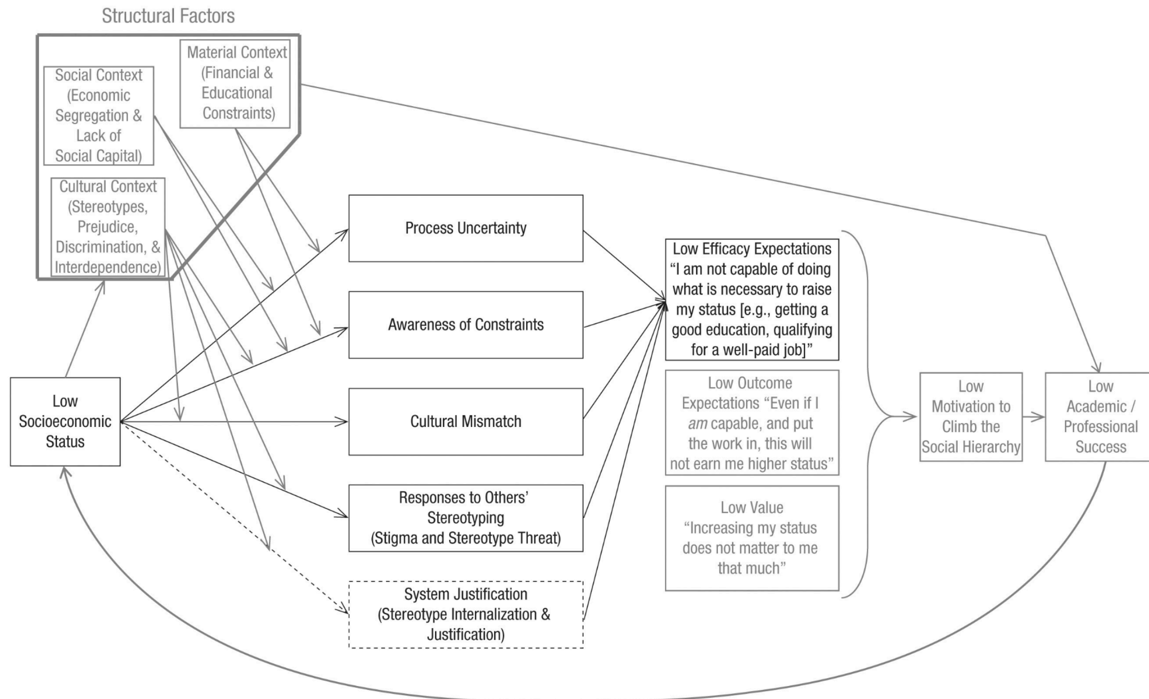


Figure 2. Motivational Accounts of the Vicious Cycle of Social Status: An Integrative Framework

3. Methodology

The study is based on a qualitative design centred around semi-structured interviews with a range of parents, teachers, school administrators, and community workers located in the Rotterdam and The Hague areas.

3.1. Inclusion Criteria

Stakeholders were chosen based on characteristics identified through a literature review and the theoretical frameworks outlined above. Parents, and school staff were included due to their direct educational involvement (Rodrigues et al., 2018). Community workers were interviewed as key stakeholders with broad knowledge of social dynamics affecting development within and beyond the school environment (Ainsworth, 2002; Duncan & Murnane, 2011).

Inclusion criteria varied per participant group. Teachers, school administrators, and community workers were selected based on their work in a neighbourhood of multiple deprivation. Teachers must have taught students aged 10-14. Parents had to have a non-Western migration background and a child in late primary/early secondary school. Students were included based on their migration background, the completion of primary and secondary education in a Dutch school, and their current or recent past enrollment in WO (university-level) education. While this criterion is important for the study's framing, this means only students with a migration background with a particular educational profile were included.

3.2. Sampling

Participants were identified through a multi-step sampling strategy. First, neighbourhoods of interest were identified. These were chosen based on SES-WOA scores, average income, average educational attainment, percentage of households receiving government benefits, and percentage of residents with a non-Western migration background (Consumer Data Research Centre, 2016; Longley et al., 2024). Data

for these categories was taken from national and municipal databases. Next, schools in these neighbourhoods were chosen based on low student performance and the high numbers of students per class to identify schools that were struggling. Of the 27 identified schools, 13 were contacted by email and/or phone, and 14 were visited. Furthermore, school staff, usually reception workers but occasionally teachers, were approached. Two schools agreed to participate. Eight community workers based in disadvantaged neighbourhoods in Rotterdam were approached; two agreed to participate.

Due to time constraints, limited access, and low response rates, the study shifted to a combination of convenience and snowball sampling from its initial strategy (Emerson, 2021; see Appendix B). The study was advertised on Instagram. From this, students, teachers and parents responded, who, in turn, shared contact details for a wider range of potential participants. This advertising led to the participation of two teachers and two students. Two further WO students were recruited based on their previous participation in diversity and inclusion projects at TU Delft and one was recommended by another participant.

3.3. Interviews

In total 14 semi-structured interviews were conducted. The participants can be broken down into the following groups:

1. Teachers and school directors from primary and secondary schools (n=5).
2. Parents with a migration background and child(ren) in late primary or early secondary school (n=4).
3. University students with a second-generation non-Western migration background (n=5).
4. Community workers (n=2).

Participant totals add up to more than 14 due to interviews with two *boundary workers*[1]—one was a parent and teacher, the other a parent and community worker. During the interviews, I clearly, verbally,

[1]Boundary-workers are those with a 'foot in multiple doors', who are able to bridge gaps between different people, thereby facilitating collaboration (Snorek & Bolger, 2022)

demarcated questions aimed at their perspective as a parent from that of a teacher or community worker. These aspects of their identities cannot be separated and influenced their responses. Regardless, I believe these intersectional experiences add valuable perspectives. Moreover, the existence of boundary workers points to an important potential area of intervention for TU Delft.

Interviews with students were more reflexive. These interviews involved visually stimulating activities. Participants could choose between creating a mindmap, a timeline, or a drawing relating to their educational journey. They were then asked to present their creation. Participants could refer to their visuals throughout the interview to aid memory recall and help guide their answers (Ellis et al., 2013). Furthermore, these participatory aspects reduced power imbalances by centering participants' agency.

3.4. Data Analysis

A qualitative thematic approach was used for data analysis (Braun & Clarke, 2006). Analysis was done using NVivo. This method combined an inductive approach (where themes emerged from the data itself), and a deductive approach (where predetermined themes were derived from the theoretical frameworks) (Azungah, 2018). Grounded theory guided the initial inductive coding of the transcripts (Morse, 2021). For the deductive approach, Situated Value Expectancy Theory and the Motivational Accounts of the Vicious Cycle of Social Status Framework were used to develop the initial codes (Eccles & Wigfield, 2020; Laurin et al., 2019).

4. Results

I break down the findings into eight themes. Under each, I highlight areas of agreement and friction between stakeholders.

4.1. Parental Educational Involvement

Teachers highlighted that parents with lower educational attainment and SES often had less time and resources to be active participants in their child's education. A school director made the following observation:

> *Students have to do it alone, and it's not because parents are unwilling—sometimes it is that way—but parents are unable. Because they don't have that level to understand what the child needs, or they don't have the time because they've got two jobs or six kids.*

Many parents struggle with involvement in their child's education. This is, thus, an important area where support is needed. However, there are further reasons for this lower level of participation, which have become a major point of contention.

4.2. Parent-Teacher/School Relations

All stakeholders mentioned the difficult relationship between families with a migration background and schools. They identified a range of types and reasons for this friction.

Social Engagement

Parents had mixed feelings about schools. While they were generally positive about the quality of education, they reported feeling disconnected from the schools. This was due to several reasons including different expectations of social interactions with teachers and school events. One parent found that how school-based activities are run feels impersonal and cold:

> *We live in Holland, so things are organised in a Dutch way. I think it's logical but for example, in Morocco, they have a different method to connect with each other. So when you ask them to come to a gathering and then there is a PowerPoint presentation and*

> *people are sitting and listening and after half an hour you have to raise your hand and ask a question, that's not the way they deal with things.*

When asked about how these could be improved the parent pointed to the following changes:

> *Don't start with a PowerPoint presentation. Something like having food is a low bar, so people don't have the idea that they are in an assembly ... Don't go immediately to what's on the agenda but ask "how are you?" "How's your family?" "Did you have a nice holiday?" A very personal way of talking. And after that, maybe it takes 20 minutes before you go to the question. ... With the school, there's no room for those things.*

Another parent reflected that they did not see many other parents with a migration background occupying roles open to parents at school. Of those who do participate "Most of them were white".

The same lack of school and community participation from families with migration backgrounds was noted by the community workers, and teachers. However, some did not connect this to notions of cultural appropriateness. As one community worker contended:

> *The parents don't vote ... because it's up to people to take their responsibility to vote or not to vote. And I see the average Moroccan parent, Turkish people ... they don't vote. They don't get involved. Sometimes we have gatherings with the neighbourhood ... and they don't come!*
>
> *Sometimes they think: "it's not for me because it's typically Dutch to have a gathering to talk about things."*

There are, then, competing expectations of parental involvement in their children's education. However, these do not appear to be fundamental conceptual differences. Instead, they are driven more by the slight cultural mismatch between practices in the Dutch education system and the expectations of parents with a non-Western migration background.

Conceptions of Child-Rearing

Child-rearing practices were an area of more conceptual disagreement. In particular, one teacher pointed to the significant differences between teaching in high and low-income contexts in this regard:

> *What I found a little bit difficult is that—and that's why I like teaching in the schools that are very comfortable—because with most parents, I have the same view on how you raise kids and what you want for your kids and what's normal and … well, basically how you raise kids. With a lot of the parents in this school, in this classroom especially, I'm really on the same page and talk the same languages as a matter of speech, even if you don't speak the same language.*

> *In that other neighbourhood it was much more difficult. ... Like with healthy food and keeping track of your kids for homework and stuff like that. And the parents in that neighbourhood had so much less resources basically.*

Importantly, these differences impacted the relationship with parents and teachers as parents took teachers' advice as attacks on their parenting practices.

Prejudice and Reflexivity

The previous two areas of friction, combined with a lack of critical reflection on behalf of all stakeholders, have shaped harmful opinions about each other. For example, a community worker claimed families with a migration background do not take the initiative to connect with the people in their neighbourhood. When they move to a neighbourhood, they do not try to get to know their neighbours and thus "never know where they live or who's living next door". Another community worker harboured very negative feelings about the lack of engagement from parents with a migration background: "Sometimes it makes me angry that they don't get involved that much." Some took a defensive stance as a response to accusations of bias. One school director remarked:

> *It's very hot in the news and we call it "kansenongelijkheid" [inequality of opportunity]. It's kind of a thing that makes me angry because the government, everyone in onderwijs [education] is talking about kansenongelijkheid. ... They insinuate that we give children with a not-so-good background less chances than the children of well-educated parents. That's what they insinuate. But I don't think it's true ... I think it's very stupid because if you have a heart to teach children, you teach all children.*

However, as the interpreter present during the interview—who themself has a migration background—noted, cultures differ. While in most areas of the Netherlands, newcomers are expected to reach out to the host community, elsewhere, the roles are often reversed and the host community is expected to take that first step.

Education requires a lot of labour and these opinions may be a result of disillusionment. The same director argued that "It's a hell of a job, it's kind of like a top sport. I think a lot of people don't know, but you're busy, I work 60 hours a week and I feel responsible my whole life." This indicates a wider structural issue of school staff being overburdened. The issue still remains that students and parents are

impacted by this, pointing to the need for support for teachers in their reflexivity within this demanding context.

4.3. Networks

Various stakeholders mentioned the value of networks in providing information and as spaces for potential intervention. These include both networks for children and parents.

A key point that came up was the potential of non-school spaces. Teachers mentioned that sometimes, they feel as though there may be a power imbalance between parents and schools and that this might pose a barrier for parents to reach out to them. A physical education teacher who also worked as an instructor at a sports club said the following:

> *I think some parents think that as a sports teacher or a coach ... you're a bit more on their level of things ... and I think that that might also make me feel a bit more approachable.*

A community worker echoed this sentiment. While schools play a central role in children's educational development, community networks are also key. Consequently, the community worker underlined the importance of diversifying spaces for individual engagement: "The network is important, one of the best ways is sports camp. That kind of activity, going to the beach, they really can connect with each other." Such activities bring together both children —which can help create bonds with peers—and parents—which helps build the social capital necessary to navigate the education system. For example, one parent argued that when their daughter is interested in a field of study they are not familiar with, they can turn to their network to better understand how to support their child:"I have a couple of friends who are doctors. So I regularly talk to them to understand how it works over here, what she can do, and what she can achieve." Networks are thus crucial for both the social capital-building and information-exchange.

Teachers also underlined the value of networks in streamlining and coordinating (municipal and regional) outreach initiatives.

4.4. (Safe) Spaces

Many low-income families need a workspace for children. One school director recounted a particular powerful home visit he did after a child consistently failed to do his homework:

> *I had one student—he's a decent student, but he never had his homework done, and everybody was bugging me. His mentor said "Why doesn't he have his homework done? He doesn't take it seriously." And so I did a home visit and it was a two-bedroom apartment, one for the parents and a baby, and one bedroom was two stacked beds with four kids and a closet. So he had to do his homework on his bed with two little brothers and one little sister constantly around. There wasn't even a table to do his homework. ... Even if he wants to, there's no time or possibility.*

Another school director noted that they often saw young children from poorer families out on the streets well past seven p.m—even in winter:

> *There's one boy, his mother doesn't take care of him and his father is in prison. So it's very sad and we help him as much as we can. But last week I was going home and it was 7:00 and he was still on the street and he didn't get food.*

One community worker confirmed this need for safe spaces that children can use if they are unable to receive adequate care at home: :

> *At 8:00 in the evening maybe I still see immigrant children, maybe 10 years old. Not only in the summer times when it's nicer. But also when it's dark outside and I see little children playing, I think you know, as a parent you should call your child at home.*

While some stakeholders acknowledged that this lack of safe space is often a result of factors such as poverty, some also highlighted parental responsibility. One community worker said "I think it's not always to blame the system, the parents have to take more responsibility." This means that interventions should target parental agency.

4.5. Role Models

All stakeholders emphasised the importance of role models and the influence—both positive and negative—these can have on a child's life.

Positive Role models

Four of the students mentioned viewing their parents or other family members as role models. As a teacher highlighted:

> *You have the kids from parents with higher education themselves and mostly those kids are ambitious and they really, really want to succeed at a high level, they really expect that from themselves. And they also are already thinking about the kind of education they want at university. They tell me "I wanna be a lawyer, I want to be an engineer, I wanna to be a doctor" and stuff like that.*

The teacher highlighted that positive role models are especially necessary in low-income settings: "You need to broaden their worldview, because there's so much possible. There's so much to do, especially kids in disadvantaged neighbourhoods, they have no clue." Having role models with higher educational attainment, can help students actively think about and envision higher education as part of their future.

Negative Role models

Negative role models—people in a child's life that set a 'bad' example (eg. antisocial behaviour and negative attitude towards education)— are an important countervailing factor. Two different reactions to such influences were noticed. Some children repeat negative role models' behaviours, entering an environment where antisocial behaviour is normalised and encouraged. A community worker highlighted that, in low-income settings, it is easy to get trapped in this cycle.

> *Unfortunately they find other ways to have an income. If you see your neighbour, or your child, or your friend has Nikes and he doesn't work, his father and mother don't work, you want also the Nikes and after that you also want the scooter and then the car, and he doesn't go to school—you wonder how it can be? And so you look to different manners to gain money. You go to sell drugs, you do other other things. So I think when you are surrounded in such an environment, it's very, very hard to escape that.*

When asked to reflect on how to break the cycle, the community worker emphasised parental responsibility in not turning a blind eye: "If you don't ask how they got [the expensive items] that's the start." Importantly, they acknowledged that this is only applicable when the negative influence is not a family member.

Conversely, one student mentioned that they believed having a negative role model in their life and seeing the toll it took on their family motivated them to do better.

> *There might be a possibility that I maybe kind of repressingly did it because my brother didn't do it and because he didn't go to school. There were also kind of problems within the family because of that. And so maybe, after I saw that I kind of was like, "OK I'll do it then but better", … besides the fact that I really wanted to know more stuff.*

This student highlighted the importance of intrinsic motivation and educational interest in breaking familial cycles of low educational achievement.

4.6. Children's Experiences of School

Racism and Social Development

Many students reported feeling discriminated against in their school environment, which influenced their behaviour and development. One noted that teachers treated them differently to white students, giving them less attention and showing less interest in their life. They reflected that this contributed to a personality change

> *I kind of closed up because of that and became a very shy kid and didn't really talk a lot. And I feel like there were a few times where I think I was being bullied, but then I just wouldn't speak up.*

Another recalled feeling isolated as they were the only student with a migration background and were bullied because of this.

> *I was the only Turkish girl—only girl with a migration background throughout most of the years of my primary school. So sometimes I did feel kind of isolated. I remember some of my classmates going "Ohh Turkey, Turkey, Turkey" to me and it just wasn't always that nice.*

Many students underlined the importance of peers they could connect with and relate to in terms of cultural backgrounds.

Intellectual Development

The feeling of disconnect from peers was exacerbated by the academic performance. The students mentioned not feeling challenged in school:

> *I think what they ended up doing in primary school was give me more instead of more challenging things. So I would just like sit whilst the teacher was explaining something to the whole class. And I would have finished all of my equations and just sit and listen*

> *because I had to wait until it was done because obviously there are also people in your group that aren't as quick and need some more time to understand.*

Students recalled that when they were done with work early, they would often chat with classmates, one interviewee said"When I was done, I was just talking with the other children. At times, we also distracted each other. Looking back, I would have liked to have [extra challenges]." As a result of their anti-social behaviour, the students were characterised more negatively by teachers.

4.7. Abstract Nature of Technical Studies

Both teachers and parents contended that, unless they attended technical study themselves, they found it difficult to discuss these subjects with students. A teacher explained:

> *In primary school, it's a little bit abstract to explain to kids what a technical study means or what you're actually doing and it would be valuable for universities—or other levels of education—to come to schools and talk about their programs.*

Similarly, given their unfamiliarity, one parent indicated the labour necessary to stay engaged if their child chose to do a technical study: "My daughter is still in her the first class of secondary school so in about 3-4 years I'll have to do my homework because at this time I really don't know." This highlights the need to invest in existing networks for spreading information.

4.8. Conceptions of Success

Participants indicated a range of notions of 'success'. Both parents and teachers argued that they were satisfied as long as the children did their best. However, parents with higher education attainment implied that success meant attending the higher levels of secondary school and, subsequently, university. Many teachers identified a similar trend.

While parents influence their children's understanding of success, other social circles also play a role. One student underlined the importance of socially-based notions of success. The student's peers prioritised employment and community over continuing past the baseline requirement for education:

> *What I noticed with my cousins, for example, most of them didn't really have any interest in going into higher education and a lot of them were just kind of like "We want to stay*

> *here. We just want to stay with the community and the most important thing is just being able to work after school". Whereas my mom was always like, "You're gonna go to uni." I think moving out of that community meant not necessarily being peer pressured to be like my cousins. Because whenever I would visit them, I notice myself down-talking liking school or not even talking about it because they maybe didn't like it as much or weren't doing as well.*

This shows that intrinsic motivation and family support helped counter such social influences.

5. Discussion

5.1. Main Findings

This study aimed to identify stakeholders' needs in helping children with a non-Western migration background and lower SES in realising their educational potential. Moreover, TU Delft requested research into six sub-questions (see: *Study Purpose*). Due to its breadth, four of the sub-questions are covered by answering the primary research question. It will be made explicit where this is the case. The results point to several recurring themes.

Stakeholder Needs

1. Need for Alignment Between Stakeholders (Parents, Teachers, Organisations) and Positionality

There is a disconnect between stakeholders, especially between those providing services, and those for whom the services are intended. This disconnect is, in part, fueled by differing cultural perspectives. These differences in approaches to social activities further the rift between stakeholders, in part due to insufficient critical reflection. These findings are corroborated by existing research which confirms that, although the intentions of the care providers[2] are often 'good', they often lack reflection on positionality and the wider circumstances. This leads to the formation of biases and harmful stereotyping (McCrory Calarco et al., 2022). Boundary actors play critical roles in bridging this disconnect. To address sub-question four, widening participation programs can act as mediators and connectors by using their networks, they can also support service providers by providing workshops on reflexivity as a way of reaching them.

[2] 'Care' and 'services' are used interchangeably to refer to the services provided by schools, community workers and other similar institutions.

2. Need for Networks

Networks play an important role in helping students and parents. For families, they offer opportunities for connecting with other children and parents, social capital-building, and information-sharing. Parents noted that they could turn to their networks for questions about education.

Non-school spaces are key spheres of influence and network-building. Sports clubs are one such space as, in the Netherlands, these are usually tied to neighbourhoods and involve multiple generations. This space is especially relevant as sports are shown to help build social capital, benefit psychosocial development, and positively affect educational attainment (Janssens & Verweel, 2014; Moeijes et al., 2018; Pfeifer & Cornelißen, 2010). This study found that parents with a migration background were more involved with sports clubs. Moreover, many parents felt that coaches were more approachable than teachers. To date, research on the role of sports clubs as spaces of intervention for promoting certain behaviours is mostly limited to health promotion (Kokko, 2014). The potential of sports clubs and other non-school as spaces for widening participation and promoting access to higher education requires further research.

3. Fostering Resilience, Confidence, and Social Capital

Students with a non-Western migration background and low SES reported feeling less recognised by their teachers which sometimes negatively impacted social development. These findings are in line with existing research highlighting that lack of recognition can further entrench educational achievement gaps (Vieluf & Sauerwein, 2024). Furthermore, some students perceived their limited social capital as a hindering factor, reflecting that they sometimes had difficulties connecting with classmates,were ostracised, and faced microaggressions. Hamel et al. (2022) identified a similar dynamic in Germany and underlined the importance of interventions tailored at addressing this disconnect as social bonds are key protective factors in educational success. This led to negative perceptions of one's social capital (see: sub-question five).

Students who have overcome barriers and attended university exhibited a remarkable sense of resilience, intrinsic motivation, and relied on support systems outside of school. This is supported by Turcatti's (2018) findings that students with a migration background rely on these protective factors in face of structural obstacles. These insights underline the importance of fostering and encouraging students' intrinsic motivation, and to improve the teachers' academic recognition of students with non-Western migration backgrounds (Jungert et al., 2020; Vieluf & Sauerwein, 2024). Spaces for children to form relatable and stimulating peer connections are also crucial.

4. Need for (safe) Spaces

Many students struggle to do homework at home. This lack of space disproportionately affects students from low-income neighbourhoods (Garrett-Peters et al., 2016). There is a need for safe, calm (work)spaces. Competent caregivers and role models should be present here, as students from disadvantaged neighbourhoods are less likely to have such support elsewhere (Zady & Portes, 2001).

5. Need for (Positive) Role Models

Both teachers and community workers highlighted that students from disadvantaged neighbourhoods were less likely to have positive role models. This finding is in line with existing literature (Kearney & Levine, 2020). While all participants identified a family member as a role model for desirable attributes related to success, only one student reported having a STEM role model in their immediate family. Intrinsic motivation and family support are protective factors against negative role models (outside the family circle). This underlines the need for early support for students to develop such motivation and to further empower those already motivated.

6. Reducing the gap between parents, teachers and STEM

Where parents or teachers do not have a STEM education themselves, they found it difficult to discuss this with students; this answers sub-question six. This meant that STEM pathways were often excluded from discussions—both in the classroom and at home—thereby further burdening the child. When

students did express an interest in a STEM career or study, parents expressed not knowing where to begin looking for information or how to guide their child. To some degree, this was mitigated by information-sharing networks. However, not everyone has access to such contacts. This relationship between STEM-backgrounds in students' environments—specifically their teachers'—and students' aspirations is under-researched.

To address the lack of knowledge of STEM pathways, accessible introductory content (e.g., short video series, workshops, or flyers) can be created. This content should not only introduce parents and teachers to STEM pathways, but also provide guidance on how to discuss the topic with children and direct them to existing resources.

Sub-Questions

Parents' and Teachers' Expectations of Students' Aspirations

Parents and teachers want the best for children: success was measured by students doing their best in school and their ability to lead a fruitful life. However, parents with higher educational attainment implied that the higher levels in secondary school and university were the way to achieve this. Previous research has indicated that higher-educated parents tend to have more academic aspirations for their children's education (De Boer & Van Der Werf, 2015). Numerous studies have found that parents with a migration background have high aspirations for their children, as a common reason for migration is improving SES and, in Western contexts, education is seen as a key mobility channel (De Boer & Van Der Werf, 2015; Rijkschroeff et al., 2005). Four of the five student participants interviewed shared this experience. Parents did not express this sentiment explicitly, though this may be attributed to social desirability bias as parents may not have wanted to appear too strict (Bornstein, 2019). While teachers held similar understandings of success, they tended to less actively encourage further educational engagement. At times, this made students feel under-stimulated. Consequently, students' educational potential is left under-explored (see also: sub-question two).

<u>(Lacking) Support for Students, Parents, and Teachers</u>

Though some support already exists (networks, sports clubs, municipal initiatives, etc.), there are many insufficiencies (in-classroom help, lack of STEM information sources, spaces for homework; see main findings). Presently, the support in place is slow and bureaucratic. This points to a need to streamline existing support—especially at municipal and regional levels.

5.2. Implications and Recommendations

The study's results may inspire new outreach initiatives but also improve existing programs. The following section sets the groundwork for next steps or possible applications of the findings.

Rethinking Outreach

Outreach initiatives must be approached through an intercultural lens. Both individuals and organisations designing and implementing such interventions need to develop an understanding of how their positionality influences their work, and people's perceptions of them (Yan, 2016). This may consist of positionality workshops, dialogue with the people the interventions are for with the intention of mutual learning and deconstructing pre-existing biases, and further continuous processes of reflexivity. Discussions around positionality should go beyond culture and extend to concepts such as SES and intersectionality.

Concurrently, the relationship, as it is commonly conceived, between intervention designers and implementers, on the one hand, and the 'beneficiaries', on the other, needs to be deconstructed and re-imagined. Doing so would strengthen reach and impact. Moreover it would enhance space for target individuals to take ownership, thereby allowing for more organic project growth. Boundary workers, both official and unofficial—community member social workers, the parents who help host outreach events, or sports coaches corralling community members— are crucial in this respect. .

Concrete first steps include restructuring events to be more inclusive of cultures and budgets, thereby enhancing participation. This can include providing culturally-appropriate food, offering

programs for free, including childcare and transportation services to unburden parents, or making events more socially engaging. This increased social emphasis may further help strengthen parent-school relationships. I also propose participatory methodologies and collaborative co-designing of workshops, which have been shown to positively impact collective agency and mitigate power imbalances (Ishimaru & Takahashi, 2017).

Extra-Curricular STEM Programs

Such programs foster and encourage existing STEM interests, provide students with academic challenges, and support social development by connecting children with like-minded peers. These social bonds can help ease the transition to secondary education. According to Vossen et al. (2023), such schemes may enhance children's sense of belonging in STEM fields. Furthermore, by involving parents in such support networks, their engagement with their children's STEM education may be further enhanced.

Tutoring Scheme & Classroom Help

Students from universities could be employed to provide free one-on-one tutoring or classroom help, helping reduce learning disparities and support over-burdened teachers without the capacity for more personalised supervision. Tutoring schemes may be even more impactful if those providing the services share characteristics with the target population, enhancing students' engagement and offering them positive role models.

5.3. Limitations

There is some participation bias in the study's findings—particularly with teachers—as more socially-involved stakeholders were likely to participate (Elston, 2021). Social desirability bias was also noted, though triangulating perspectives helped mitigate this somewhat (Bornstein, 2019). Moreover, only current university students' experiences were included. Due to the reflective interviews, students were able to share insights current primary school students may not have been able to yet. Additionally, I could

not obtain first-hand accounts from parents with lower SES. Instead, I inferred their perspectives from teachers, community workers, first-hand accounts recorded elsewhere. Finally, due to my limited Dutch, literature in Dutch was not included. Because of the language barrier, two interviews conducted in Dutch lost nuance. Debrief sessions with the translators aimed to capture these subtleties.

6. Conclusion

The Dutch system has its merits and shortcomings. Its current makeup creates space for structural disadvantages and perpetuates harmful cycles of deprivation. This study only captures part of a much wider issue.

Large-scale structural and systemic change is necessary. The system is already reforming, slowly. While this is important, in the meantime, people must have the tools and support necessary to navigate the existing system in its current flawed state. Interventions in primary schools should not be isolated from the implementation of a wider support system present throughout the entire educational journey. Such initiatives can help break cycles of deprivation and their impacts extend beyond just access to higher education.

I hope this study can offer insights into the current needs of those supporting students with a second and third-generation non-Western migration background from disadvantaged neighbourhoods and serve as a starting point to inform and inspire outreach programs. Due to its limitations, this study should also serve as a pilot to a more in-depth exploration of stakeholder needs. Regardless, by engaging in widening participation initiatives, sharing ideas, resources and best practices, a connected network of engaged individuals and institutions can grow. With this network will come increasing influence and a powerful platform to advocate for systemic change. Hopefully, this is not a conclusion but a vision.

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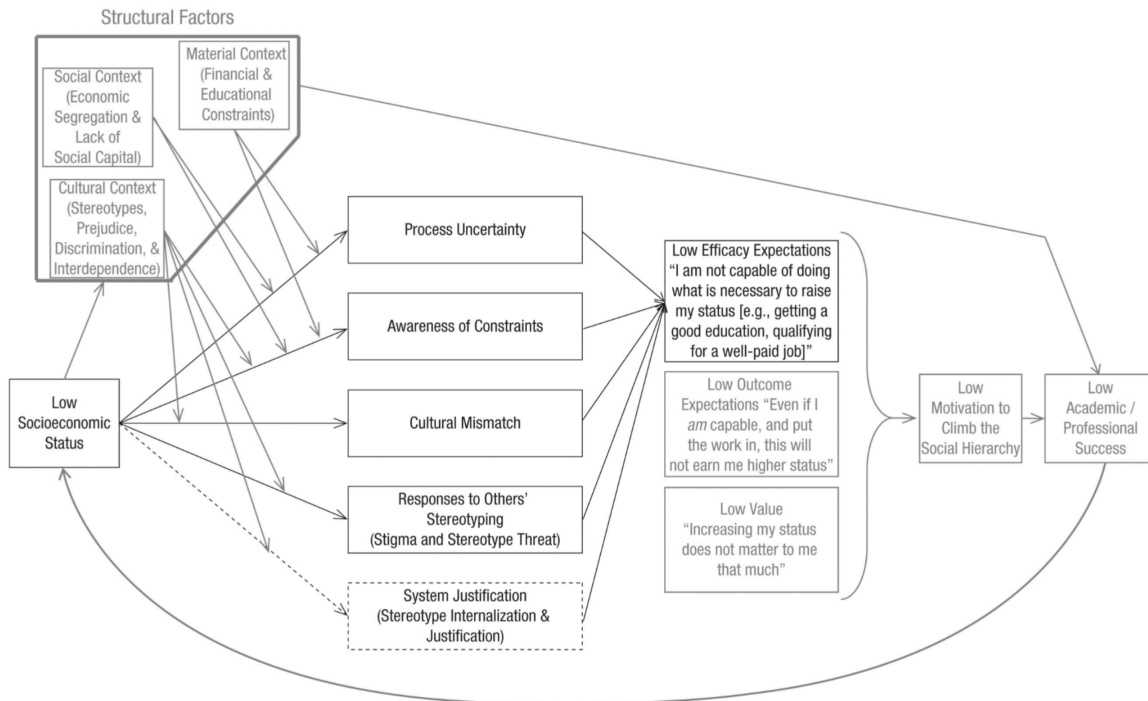
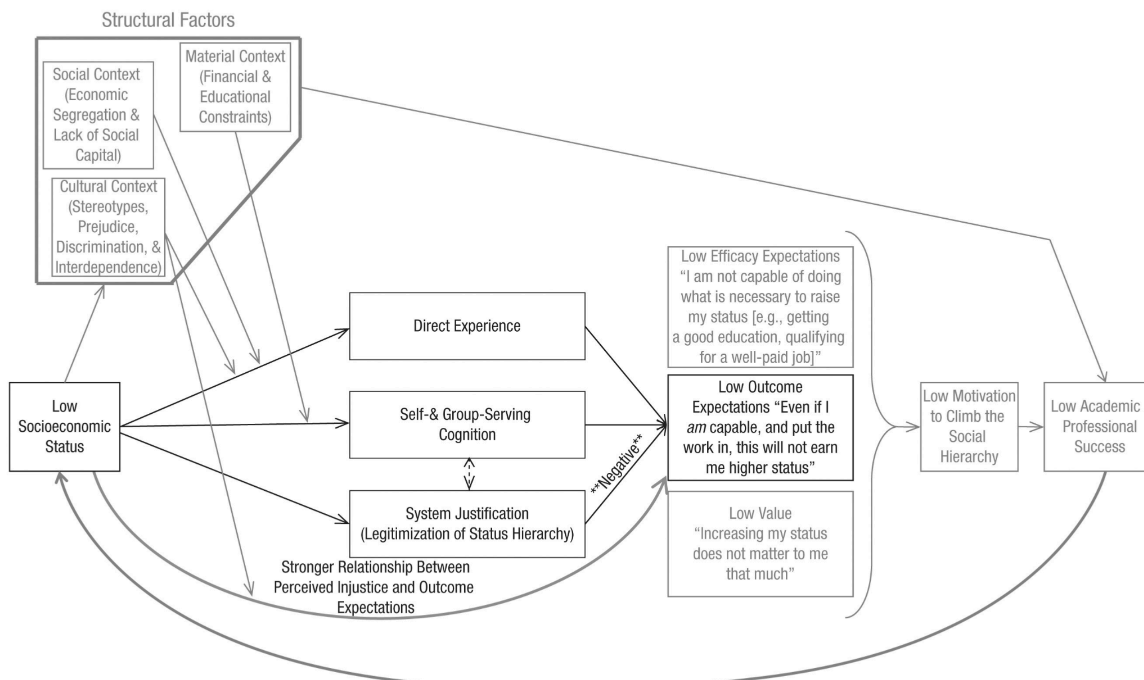
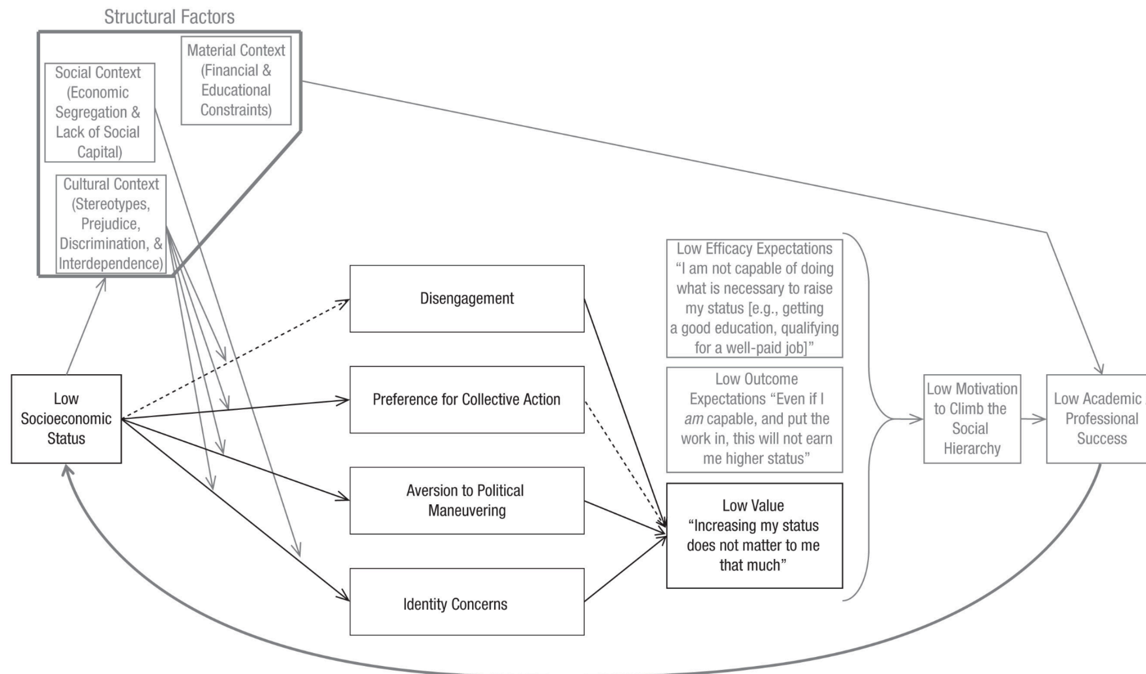
Appendix

A. *Motivational Accounts of the Vicious Cycle of Social Status: An Integrative Framework*







B. Unsuccessful sampling methods:

During visits to schools, parents were approached as they waited to pick up their children. While many agreed to take a flyer, none ended up agreeing to participate. Additionally, emails were sent to 10 teachers directly. These teachers were picked based on their teaching to relevant age groups (last two years of primary school or first two years of secondary school) or through school staff recommendations. None agreed to participate. To better reach parents, a flyer was shared in Turkish, Dutch, and English in two major Facebook groups for Turkish communities in both Rotterdam and The Hague. Furthermore, nine *stichtings* were contacted yielding no participants.