The Relation of Student Tracking to Academic Success, Educational Equity and Student Well-Being Across Different Educational Contexts. A Systematic Scoping Review.

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Abstract

Among the increasing concerns about balancing fairness with effectiveness in educational systems, student tracking is deemed to play a central role in policy and research. Therefore, this paper investigates how student tracking relates to academic success, educational equity and student well-being across different contexts. After sourcing 25 papers from ERIC and PsycINFO, a scoping review was conducted, using the PRISMA guidelines as guidance. Findings indicate that tracking can benefit high-track students through better instruction and access to resources, but may harm their lower-track peers, especially when applied too early or rigid. It was also found that tracking reinforces social disparities while showcasing adverse effects on the academic self-concept, motivation and sense of belonging for students. Flexible, delayed and equitable tracking practices are essential to promote fairer opportunities while fostering supportive educational environments.

Introduction

1.1 Background and Societal Relevance

In a lot of countries, concerns about educational inequality lead to intensified discussions regarding the structure of school systems and how to balance fairness with excellence (Parker et al., 2018). In the Netherlands for instance, national initiatives such as the LEPOVO project (Lepovo, 2025) are aiming to support education professionals by the help of research-based knowledge to strengthen the ongoing development and equal opportunities of students aged 8-14. A key issue addressed in these debates is the practice of ability grouping or student tracking - assigning students to different educational tracks based on their academic performances, interests or attitudes (Terrin & Triventi, 2022). Because tracking decisions can influence the student's long-term social and academic trajectories, it is important to raise awareness regarding questions about the balance of academic outcomes, the student´s well-being as well as educational equity. Since international educational systems are increasingly compared by programs such as PISA, the necessity of optimizing fairness and performance placed tracking at the forefront of educational policy and research (Breakspear, 2012).

1.2 Tracking

Student tracking concerns assigning students to different educational pathways, schools or classes, depending on observed abilities, interests and previous achievements. However, there are variations regarding the different educational contexts that tracking relates to, such as the academic proficiency assessments, varying tracking styles, the timing of tracking (such as early versus late tracking), the flexibility to move between tracks when comparing different countries around the world.

Countries have different approaches when it comes to assessing the academic abilities of students. For example, the Netherlands employs the "compulsory primary education progression test". The test is concerned with the language and arithmetic skills of 8th-grade students, typically aged around 11-12. However, it is not deemed to be an exam, nor has a pass or fail type grading, but is much rather supposed to serve as an indicator for teachers and students alike, as to what further education might suit the students best (Rijksoverheid. 2025). Other countries such as Finland for instance, use no tests and students are grouped in a common comprehensive school until around the age of 16. Afterward, students can pursue either higher secondary and vocational education, based on their choice and performance. They try to emphasize equal opportunities and a delayed selection for students (Kerr et al., 2013).

Countries such as Germany or the Netherlands employ the practice called "between-school tracking", in which students are placed in different educational institutions (such as vocational or academic schools). In contrast, countries such as the United States utilize "within-school tracking" practices, which involve assigning students to different ability groups or classes within the same school.

Another central aspect of tracking is timing. Whereas some countries start tracking at an early age (for instance Germany at around age 10), other countries such as Finland postpone this division to later stages of education. Some findings suggest that this may foster a more inclusive and comprehensive educational environment, especially when contrasting these two (Kerr et al., 2013).

Additionally, permeability – the degree to which students are able to switch tracks over time – differs vastly. Going back to the example of Germany, the placement of the student to a specific institution often remains stable due to lower flexibility of movement in tracks, which may influence access to higher education and future career pathways

(Henninges et al., 2019). Contrary to this, Switzerland for example not only starts tracking at a later age but also allows more flexibility of moving between educational tracks, thereby potentially allowing students to more easily access education that is tailored to their abilities and learning needs (Petrucci et al. 2021). These fundamental structural differences lay a useful foundation to compare how tracking influences academic outcomes across different educational aspects, such as academic success, educational equity and student well-being.

1.3 Academic Success

Academic success refers to the achievements and educational goals of students, and is considered to be one of the most predominantly used indicators to evaluate the effectiveness of educational systems. Typically, it is assessed through outcomes such as standardized test scores, graduation rates, grade progression and long-term educational accomplishments (Livingston, 2010). Not only do these indicators reflect individual student performances but they also provide information for policymakers on a national level (such as the Cito Test in the Netherlands) and on an international level (like the international benchmark test PISA) (OECD, 2025; Cito 2025). In the ongoing discussion about student tracking, dropout rates, post-educational outcomes and academic success are seen as critical factors and are often the focal point of discussion for both proponents and critics alike. Highlighting the aspect of academic success, Terrin and Triventi (2012) claim that the key argument for student tracking is that groups of students with similar skill levels enable instructors to tailor their teaching methods better to the students´ needs, interests and abilities, thereby allowing for more efficient learning processes. However, the interplay between tracking and academic success is not that straightforward. Research indicates mixed results, with some studies suggesting that there might be benefits for high-track students through better instructional quality, peer environments and access to resources. Others highlight the negative effects for students placed in mid-lower tracks by the lack of these benefits (Johnston & Wildy, 2016).

Another important aspect is the timing of tracking. When tracking from an early age, high-track students might be at risk of experiencing negative effects, such as an increase in performance pressure and stress, since being allocated to a high-track from a young age can evoke feelings of high expectations, potentially impacting the mental and emotional well-being (Böckerman et al., 2019). Tracking lower-track students from younger age on the other hand might result in them experiencing less competition related stress and more tailored support (Terrin & Triventi, 2022). Later tracking however, might lead to a greater diversification of skills for high performers since they are not pushed to pursue narrow pathways. They might also be exposed to a broader communal and academic environment, thereby potentially allowing for more educational and social opportunities (Knigge et al., 2022). For low performers, later tracking might be beneficial due to a lowered risk of being misplaced from an early age. They might also have more opportunities to let their potential unfold, rather than experiencing to be stuck in a specific track (Karlson, 2015).

These findings alone highlight the necessity to investigate the impacts different tracking systems have on academic success, with the aim to hopefully inform future educational policy decisions.

1.4 Educational Equity and Track-Level Differences

Educational equity concerns the principle that all students should have equal opportunities to succeed within the educational system, regardless of their background (OECD, 2018). However, in the context of student tracking, educational practices may be more likely to undermine equity, rather than supporting it. The divide between lower and higher tracks is a central feature of most tracking practices, where high-track students generally receive better instruction, greater access to resources and more experienced teachers, while low-track students often don't (Mayer et al., 2018). Findings suggest that students from lower socio-economic backgrounds are disproportionately more likely to be

placed into lower tracks, even when their academic abilities are on par with their peers in higher tracks (Sevilla & Treviño, 2021). This raises concerns about how tracking may reinforce already existing inequalities through the uneven distribution of said high-quality curricula, resources and skilled teachers (Gamoran, 2009). It is therefore problematic to assume that students in the lower track perform worse due to innate limitations, as it overlooks the negative impact of environmental and structural downsides that are tied to lower track placement. Additionally, placements of students in lower tracks may restrict the students´ access to better academic opportunities while also negatively shaping the expectations a student has of their own success (Belfi et al., 2012). Therefore, it is essential to investigate if tracking practices are inhibiting the academic potential of students from disadvantaged backgrounds by widening the opportunity gaps.

This thesis aims to approach equity not as a result of ability but rather questions the access and fairness of different tracking systems, especially in how they aid or obstruct students based on their social background.

1.5 Tracking and Student Well-Being

Although academic success is often the centre of discussion when evaluating tracking practices, the effect they have on well-being of students is also highly relevant. Students well-being can be described as their overall emotional, psychological and social state, which is influenced by their feelings about themselves, their relationships to others and by the place they take within educational environments (Pollard & Lee, 2003). Research suggests that if students are placed in lower tracks, they themselves as well as the teachers might have less expectations regarding their own academic achievements, which can lead to reduced academic motivation (the internal drive to pursue ones goal further), disengagement from education or them dropping out. Similarly, lower-track placements are often associated with less self-esteem (the diminished perception of one's own worth, abilities or value), which has

been linked to potentially increase the student's stress and depressive symptoms. Lastly, students in lower tracks might experience feelings inferiority and exclusion by comparing themselves to the higher track peers, which may result in a weaker sense of belonging (reduced feelings of being accepted or connected within a group or community), increased emotional stress and the ostracization from school environments (Belfi et al., 2012). On the other hand, students placed in higher tracks indicate having more positive academic self-concepts (ASC) being more satisfied with their education. ASC refers to the perception the student has regarding their academic competences and is influenced by their experiences, social comparisons and educational systems. This is often attributed to better peer influence, more stimulating learning environments and higher expectations they have for themselves (Steenbergen-Hu et al., 2016).

These observations underline why the debate around tracking should not be centred around academic metrics - but that it should also focus on other variables that are directly influencing these measures. Therefore, this thesis is also concerned with the effects of tracking on the student's emotional and psychological well-being.

1.6 Research questions

Main question: What is the relation of student tracking to academic success, educational equity and student well-being across different educational contexts?

Sub questions:

1. How is student tracking related to academic success?
2. How is student tracking related to educational equity?
3. How is student tracking related to student well-being?

Methods

2.1 Study design

This study made use of the scoping review methodology to explore what is known in current literature about the relation of student tracking to academic success, educational equity and student well-being. Utilizing a scoping review was deemed to be suitable for the aim of this study since it allowed to systematically map out a broad range of literature and identify key themes without generating quantitative effect sizes (Arksey & O´Malley, 2005). To ensure transparency, methodological precision and reproducibility, this review was conducted using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) checklist as guidance (Page et al., 2021) (see Appendix 1). It is important to note that the checklist was not followed closely, but more so functioned as a tool for direction. The process was centred around a structured search in 2 different databases, a set of predefined eligibility criteria, followed by a systematic screening and the subsequent data extraction. Lastly, to present the findings, a narrative synthesis approach was implemented to organize and present the findings.

The goal of this scoping review is to investigate how student tracking relates to academic success, educational equity and student well-being. To be consistent with the exploratory style of scoping reviews, rather than testing hypotheses, this study aims to map existing research and to identify recurring themes, while highlighting areas which might need further investigation. The inclusion criteria, data extraction and strategies for synthesis are all shaped by these questions to allow for a thematic analysis of tracking practices and how they are studied and understood between different educational contexts.

2.2 Eligibility Criteria

The inclusion as well as the exclusion criteria were applied to guarantee that the studies selected for this review were relevant to the aim of the research. (Table 1)

Table 1

Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
- Published in or after the year 2000	- Studies focussed purely on higher education
- Were concerned with student tracking, ability grouping or similar educational stratification practices relating to at least one of either: academic success, educational equity or student well-being	- Literature that did not include any of the target outcomes (academic success, equity or well-being) in the title, abstract or key words
- Written in English	
- Were peer-reviewed journal articles, academic literature reviews, or dissertations	
- Focused on educational environments of students between the age of 4 to 18 years old	

2.3 Information Sources

To identify relevant literature, two electronic databases were searched: APA PsycINFO and ERIC (Education Resources Information Center). These databases were chosen specifically since they have a strong coverage of educational research and psychology, which is central when investigating the dimensions of student tracking, academic outcomes, educational equity and well-being.

2.3.1 Search Strategy

The search string was developed to include student tracking and academic success as well as their appropriate synonyms and related terms. Afterward, it was applied to the selected databases ERIC and PsycINFO. A total of 345 records were identified across both databases, 113 in PsycINFO and 232 in ERIC, with 33 duplicates being removed afterwards (Figure 2).

Educational equity and student well-being were later reintroduced, by utilizing the inclusion filter tool in the screening phase.

The final search string used for this review was:

("student tracking" OR "ability grouping" OR "academic tracking" OR "school stratification" OR "homogeneous grouping" OR "school ability grouping" OR "classroom differentiation" OR segregation in education" OR "curriculum tracking") AND ("academic success" OR "academic achievement" OR "learning outcomes" OR "student performance" OR "educational attainment" OR "test scores" OR "standardized testing" OR "GPA" OR "grade progression" OR "graduation rates" OR "school performance")

To combine synonymous terms, Boolean operators (AND/OR) were used. There were no date limits applied within the search string itself; however, the results were manually adjusted, based on the inclusion criteria. The final database search was conducted on 5.3.2025.

2.3.2 Selection Process

The study selection process included a multi-step screening procedure that was conducted using Rayyan, a web tool that helps to organize and filter scientific papers (Ouzzani, et al., 2016).

The inclusion criteria filter by Rayyan was utilized to check if the titles, abstracts or key word sections of the papers contained at least one of the following: "academic success", "academic achievement", "academic outcomes", "educational equity" or "student well-being". Any paper that did not reference at any of those terms was excluded. Afterward, the abstract of the remaining results was screened to determine whether it was relevant for this review. Studies that focused on unrelated themes or indicated low relevance regarding student tracking were excluded at this stage. Next, the remainder of the papers were checked for

accessibility. Any record for which the full text was unobtainable was removed. Lastly, a full text review was conducted for the studies that remained. The reasons for exclusion at the last stage of the process were a lack of relevance for the outcome variables.

The selection process is visualized in the PRISMA flow diagram (Figure 2), outlining each step of the screening and inclusion procedure. After removing 33 duplicates from the identified records from both databases, 312 records remained. By applying the Rayyan exclusion filters, further 237 records were removed. The subsequent abstract screening of the remaining 75 records, resulted in 36 records that were to be eligible for this review. Of the 36 records, 31 were accessible. Lastly, the remaining 31 papers were full text reviewed, 6 of which were deemed to be not relevant due to a mismatch of their investigative outcomes and the objectives of this review. This resulted in 25 studies being included in the final synthesis.

Table 2

PRISMA Flow Diagram

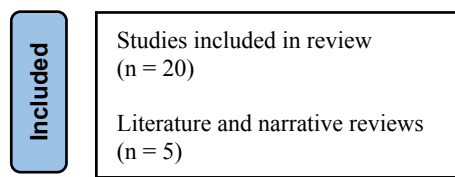| Included	Studies included in review (n = 20) Literature and narrative reviews (n = 5)
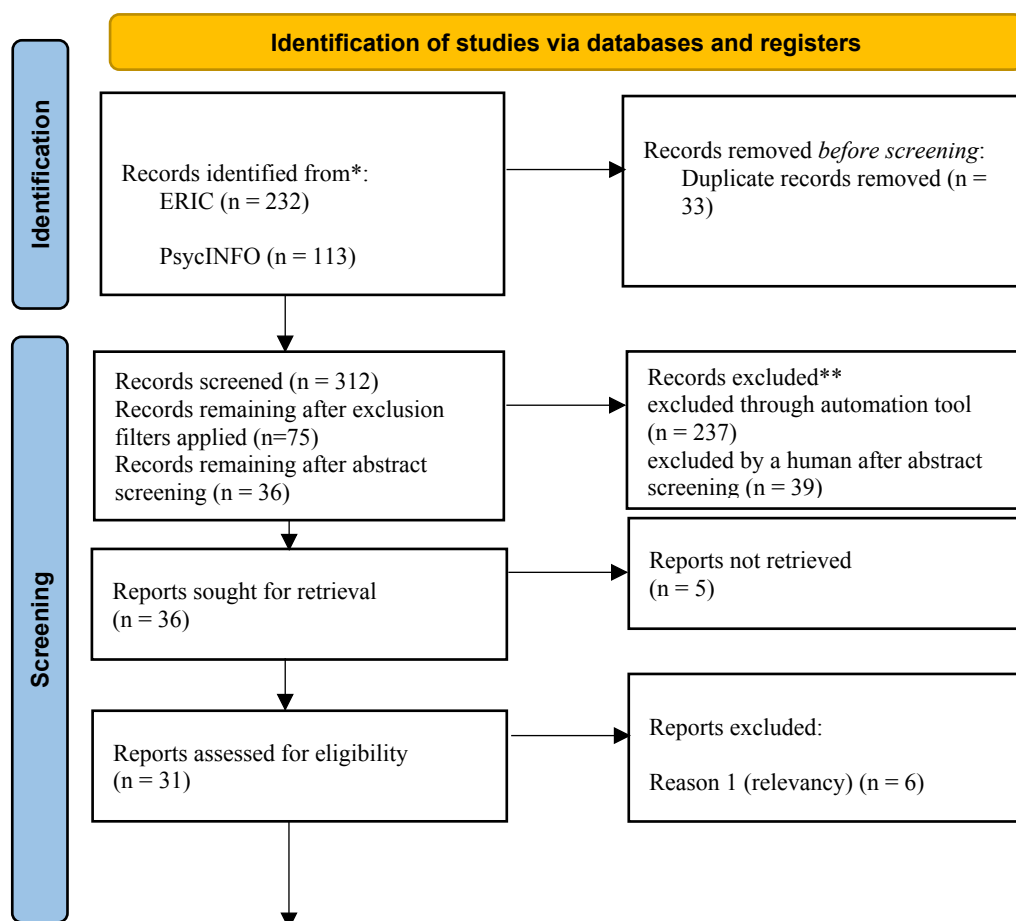
Figure 1

2.4 Data Analysis and Synthesis

To be able to systematically sort and compare information across research, this review made use of a structured data extraction process. A custom chart was developed to capture key characteristics and findings of all included studies, laying the foundation for the synthesis of the findings. The extracted variables that were used by for the review included the authors and years of publication, the country in which the study was conducted, the study design and the source type. Additionally, information about the educational level and age of students as well as the main outcomes addressed in the study was gathered. The data extraction was conducted manually for each article and recorded in a spreadsheet format to make thematic comparisons less challenging.

Given the variety of study designs, outcome measures and educational contexts across the chosen literature, a narrative synthesis approach was used to interpret and summarize the findings. The goal was to map out the relationship between student tracking and academic success, educational equity and student well-being across different systems. The findings were grouped and analysed based on thematic relevance to the three outcomes. If applicable, further distinctions within each category were made by examining the types of tracking, the educational level of the students, what tracks the students were allocated to (i.e. high versus low track) as well as their social background.

Although several papers contained information that was relevant to multiple sub-categories, only a specific subset of papers were selected to be included for the written review

of each thematic category. The papers covered in the text were chosen based on scientific criteria, including their methodological rigor (e.g. longitudinal or quasi-experimental design), clear outcome reporting (e.g. availability of relevant effect sizes) or their relevance to the specific topic of each section. To ensure the inclusion of all 25 papers, they were selectively distributed across the subcategories. When a study addressed multiple outcomes, it was assigned to the section in which its methodological design, outcome clarity or thematic relevance was most applicable. This approach ensured that all included studies were integrated into the written review while allowing for a targeted discussion within each theme. To maintain consistency, only the studies that are discussed in the text are presented in the corresponding result tables.

Using these distinctions facilitates the possibility for a deeper understanding of each of the sub questions. Patterns, common themes and gaps in the literature are identified and discussed in the results- and discussion sections.

Results

3.1 Overview of Included Studies

This scoping review investigated a total of 25 studies that were published between the years 2001 and 2023. Most of the papers were peer reviewed journal articles, but a handful of literature reviews were also included (24%). The majority of articles (52%), as well as 3 dissertations (12%) employed a quantitative methodology research design (such as cross sectional, longitudinal, multilevel modelling etc.) while a few used only qualitative approaches (8%). The research of said studies took place across various sets of national contexts, with the United States, Germany and the United Kingdom being represented most frequently.

The studies focused on a diverse set of tracking systems, with 12 of 25 papers (48%) focusing only on within-school ability grouping, and 8 of 25 (32%) focusing on both within- and between-school ability grouping. Tracking usually started during secondary education, although there were timing variations. Some systems started to track students as early as primary school while others employed more flexible or later-tracking models. The age range of students of all studies laid approximately between 4-18 years old, therefore lining up well with the inclusion criteria.

When looking at the thematic coverage, (20 of 25, 80%) of the papers concentrated on academic success as a core outcome, with some papers being additionally concerned educational equity (23 of 25, 92%) and student well-being (12 of 25, 48%). Most of the studies (24 of 25, 96%) investigated multiple outcome domains such as academic achievement, ASC, well-being, motivation, levels of equity or predicted future outcomes at the same time. It is important to note that only some of the studies provided effect sizes, with studies investigating relationship of tracking and academic success being 17 of 25 (68%), educational equity being at 6 of 25 (24%) and lastly, student well-being having 6 of 25, (24%). This is partly due to a few studies being qualitative, without standardized metrics such as Cohen´s D, but mainly due to the studies only providing effect sizes for academic success, and how these relate to educational equity or student well-being.

3.2 Relation to Academic Success

A number of studies (12 of 20, 60%) this review concerns find positive associations between tracking and academic success for high-track students. 8 of the 20 studies (40%) showed negative implications for high-track students. For low-track students, 10 the 20 (50%) papers observed negative implications with the remaining 10 papers (50%) finding no implications. The combined positive and negative average effect sizes for tracking related to academic success were d ≈ 0.31 for high-track students. Of the 10 papers observing negative

implications low-track students, the average effect size was d ≈ -0.21. The summary regarding all findings of the subcategories for tracking in relation to academic success can be found in Table 3.

One study that exemplified the trends of high- versus low-track disparities was done by Woods (2023), who reported that students in higher tracks consistently outperformed those in lower tracks in standardized assessments. He argued that these differences might be largely attributed to higher accessibility of more advanced curricula, better instruction and superior learning environments, when compared to students in lower tracks. This idea is in line with Ross and Harrison (2006) who claim that such academic advantages may be closely related to instructional quality, and that it tends to be unevenly distributed among tracks. Additionally, Preckel et al. (2017) found that track placements are often interacting with the students´ASC, meaning that students in higher tracks tend to not only have better achievements, but also report higher academic confidence, which may positively reinforce their performance.

In contrast, low-track students are often met with less demanding instruction and lowered expectations, as well as a decreased ASC which may contribute to worse outcomes (Hallinan, 2003; Cheung & Rudowicz, 2003; Liem et al., 2015). However, not all findings suggest a universally consistent pattern. For example, Khazaeenezhad et al. (2012) found that there are no significant academic differences between track levels, suggesting that tracking effects may rather be moderated by the implementation techniques of institutions and systemic factors (i.e. start of tracking, resource allocation, type of tracking etc.). These findings highlight that tracking has the potential to enhance academic outcomes for some but also may reinforce structural inequalities which benefit students unevenly. They further underscore the necessity to examine how academic success is distributed within different tracking systems.

The timing of tracking also plays a crucial role. Early tracking has distinct implications for high- and low-track students. From the studies of this review, 8 of 20 (40%) suggested that, although students in higher tracks could benefit from accelerated learning and early access to advanced courses, they may face increased academic pressure, social isolation and heightened competition. For instance, findings by Preckel et al. (2017) indicated worsened academic outcomes for early tracked high-track students, such as a decrease in their ASC ($d \approx -0.40$) and school related motivation ($d \approx -0.30$). On the contrary, later tracking for high-track students shows fewer negative effects since the potentially delayed access to advanced content is deemed to only have minimal impacts and is outweighed by the potential benefits from removing the aforementioned downsides related to early tracking (Preckel et al., 2017). For low-track students, early tracking only shows benefits regarding the early identification of support needs. The downsides on the other hand suggest negative effects for academic outcomes due to lower teacher expectations, reduced instructional quality and less access to good resources. Later tracking for low-track students, however, might lead to them have more time to develop skills and demonstrate potential and increased chances of being placed in an appropriate track, thereby potentially enhancing academic outcomes. The concerns mentioned regarding later tracking in lower tracks were that there could be a slower access to targeted support and an increased chance to mismatch for students that develop at different pace (Buttaro & Catsambis, 2019).

Another important factor to consider is the mode of tracking. Two major practices of tracking found in the papers that focused on academic success were between-school tracking and within-school tracking, both of which are playing a crucial role in shaping academic success outcomes. 12 of 20 (60%) of the papers were concerned solely concerned with within-school tracking, whereas 8 of 20 (40%) focused on both. The between-school tracking approach has been deemed to potentially reinforce existing performance disparities, as shown by Allende et al. (2024). Using data from a quasi-experiment in Chile, they observed that

between-school tracking had some small positive effects on success in higher tracks. However, it came at the cost of low-track students being affected negatively, since it showed significantly lower academic outcomes as well as reduced mobility between tracks. A similar report by Johnston and Wildy (2016) suggests that between-school tracking from an early age is linked to fixed academic and professional trajectories as well as worse academic outcomes for low-track students.

On the other hand, within-school tracking - meaning students are grouped by ability in specific subjects within the same school - could offer more even opportunities for students. Findings by Nomi (2009) indicate that differentiation within-schools may be associated with better outcomes for students across all ability levels, especially in combination with high quality instruction. Additionally, Cheung and Rudowicz (2003) found that within-school tracking could support student achievements if the groups are flexible and open to change. Based on these findings, it becomes apparent that both, the between-school- and within-school model, are consequential for academic success. However, within-school tracking might be better in supporting student growth and fostering environments that benefit students' academic achievement across all levels.

Of the included papers concerned with academic success, 12 of 20 (60%) indicated that Student tracking may also have consequences for long-term educational trajectories. Johnston and Wildy (2016) as well as Allende et al. (2024) found that higher track placements significantly improve the likelihood of pursuing further education and professional development. This might not be only attributed to tracking itself since factors like the students´ cognitive ability, teacher expectations, educational qualities, as well as their parental involvement might have influences as well. However, the studies regarding the long-term outcomes followed a distinct pattern. Students in Chile for instance, were 35% more likely to follow secondary education, when compared to their lower-track peers (Allende et al., 2024).

When investigating the effects on low-track students however, it becomes apparent that tracking may restrict possibilities. Knigge et al. (2022) reported that low-track students in Germany had lower mobility and less opportunities to change their situations, thereby reinforcing inequalities. Lastly, offering a more hopeful perspective, Nomi (2009) suggested that students in more de-tracked environments, like for instance mixed-ability classrooms in which students of varying skill levels are taught together, showed higher aspirations to partake in tertiary education. In sum, these findings hint at the possibilities that tracking provides regarding the career outcomes for high-track students but also underlines that it might serve as a gatekeeper, especially in environments that offer little flexibility for low-track students.

Table 3

Summary of Findings for Student Tracking related to Academic Success

Subcategory	Key Findings	Relevant Papers
High-track students	Moderate gains (d ≈ 0.25), access to better instruction, potential pressure and competition	Woods (2023); Ross & Harrison (2006); Preckel et al. (2017)
Low-track students	Worse outcomes due to worse Expectations, limited access to quality instruction	Hallinan (2003); Cheung & Rudowicz (2003); Liem et al. 2015)
Early tracking	Can benefit high-track students	Preckel et al. (2017); Buttaro & Catsambis (2019)
Late tracking	More equity, beneficial for low-track students, small downsides for high-track students	Preckel et al. (2017); Buttaro & Catsambis (2019)
Between-school tracking	Low-track students disadvantaged, rigid tracking contributes to performance gaps and limits opportunities	Allende et al. (2024); Johnston and Wildy (2016)

| Within-school tracking | More flexible and higher equity, can benefit academic outcomes for low-track students without negatively affecting high-track students | Nomi (2009); Cheung & Rudowicz (2003) |
| Long-term educational consequences | High-track students more likely to pursue higher education, low-track students less mobility and opportunities therefore reinforcing inequalities | Johnston & Wildy (2016); Allende et al. (2024); Knigge et al. (2022); Nomi (2009) |

3.3 Relation to Educational Equity

Throughout the literature, 23 of 25 papers (92%), are at least partly concerned with the relation of student tracking with the educational equity of students in educational systems. 12 out of 25 papers (48%) explicitly address disproportionate track placements into lower tracks, when students have a lower socioeconomic status (SES) or a minority background. Furthermore, 14 of 25 papers (44%) were concerned with structural inequalities in relation to tracking, and 7 of 25 papers (28%) were addressed the flexibility to move between tracks. Lastly, 6 of 25 (24%) discuss the timing of tracking in relation to flexibility and equity. A summary of the findings about the relationship between tracking and educational equity can be found in table 4.

The disparities for educational equity are often deemed to be resulting directly from student tracking, which may be responsible for reinforcing pre-existing inequalities (Macqueen, 2011). The trope is seen across different international contexts and educational levels. For instance, Ireson et al. (2002) compared the results of national standardized assessments across different schools in the UK to investigate the effects of placing students in mixed-ability groups (meaning that perceived ability is disregarded when allocating students to classes). They found that students who previously attained lower academic achievement,

which is often correlated to SES, displayed more progress in mixed-ability groups (increase of average test scores by ≈ 2.76) than in lower groups (increase by ≈ 1.89). This supports the idea that ability grouping may disadvantage low-performance students. Research by Steenbergen-Hu et al. (2016) further supported the mixed-ability group approach by observing that the overall achievement gains for low-track students were higher for within-class grouping ($0.19 \leq g \leq 0.30$), compared to lower gains for between-class grouping ($0.04 \leq g \leq 0.06$). Findings by Livingston (2010) reinforced the idea that race and SES may be predictors of initial track placements. The multilevel models she proposed indicated that the growth of lower-SES students´ is hindered, even when they are placed in higher tracks. This hints at the existence of systemic barriers beyond classroom instruction which might reinforce inequalities. While investigating if said inequalities are also influenced by instructional disparities, Hallinan (2000) found that low-track students frequently underperformed when comparing to high-track students, regardless of their initial ability. She stated that it was largely due to reduced instructional quality as well as poorer learning opportunities and environments.

Cheung and Rudowicz (2003) were invested in the tracking effects of a junior high school in Hongkong and found that students with more disadvantaged backgrounds were predominantly allocated lower tracks, and that it has clear negative effects on the academic performance of students. This idea is further supported by a literature review from Johnston and Wildy (2016), who found similar patterns in high schools in Australia. They also argued that ability grouping has a negative impact on the equity of students, especially for those with a disadvantaged or a minority background.

The reinforcement of broader structural inequalities through tracking systems may be explained through limiting access and upward mobility. Ross and Harrison (2006) claim that differences in access to good instruction and learning opportunities across track-levels are

responsible for said structural inequalities, emphasizing that lower-track students are consistently worse off than their higher-track peers. Additionally, Taylor et al. (2019) mention that subjective track-allocation-benchmarks teachers have for students may be hindering the schools attempts to improve equality, thereby undermining consistent and fair grouping practices.

The flexibility of moving between tracks plays a central role in either mitigating or exacerbating these issues. The quasi experiment by Allende et al. (2024), found that rigid ability grouping practices are frequently correlating with reduced academic achievements for low-track students. On the other hand, systems that allow higher flexibility may enable pathways for a better upwards mobility in education. Furthermore, Wu and Becker (2023) stress the importance of better transparency and higher awareness regarding the ability to move across tracks. This could increase the students' motivation while fostering more inclusive and less judgemental environments.

Lastly, the timing of tracking in relation to flexibility plays a major role. A twin study by Knigge et al. (2022) found that early tracking is increasing the influence that the family background has on academic track placements and educational outcomes. Delayed tracking and more flexible systems on the other hand, could enable the individual ability of the student to be the determining factor. Woods (2023) supports this by underscoring the negative consequences associated with early misplacements and how it may be more easily negated through better permeability between tracks. Finally, Buttaro and Catsambis (2019) analysed data from a national longitudinal study in the United States and found that early track placements (elementary level) in lower-track reading groups predicted overall lower reading scores and increased the chance of students being enrolled into a below-grade English course upon reaching grade eight. Even when controlling for baseline achievements of the students, this pattern stayed consistent, underscoring the effects of early grouping.

Table 4

Summary of Findings for Student Tracking related to Educational Equity

Subcategory	Key Findings	Relevant Papers
SES and minority background	Are deemed to be predictors of track placements, disadvantaged students overrepresented in lower tracks.	Livingston (2010); Johnston & Wildy (2016); Macqueen (2011); Hallinan (2000); Steenbergen-Hu et al. (2016); Ireson et al. (2002); Cheung & Rudowicz (2003)
Structural inequalities	Varying access to good instruction and resources and teacher biases might hinder equality improvements	Taylor et al. (2019); Ross & Harrison (2006)
Flexibility to move between tracks	Better flexibility = more mobility, motivation and fairness	Allende et al. (2024); Wu & Becker (2023)
Timing of placement related to equity	Early placements often tied to background; later tracking focuses more on ability	Buttaro & Catsambis (2019); Woods (2023); Knigge et al. (2022)

3.4 Relation to Student Well-Being

12 of the 25 (48%) papers included in this review observe the relation between student tracking and student well-being. The papers were particularly interested in specific aspects of student well-being, with 6 of 25 (24%) examining the relationship between tracking and the students' ASC, 7 of 25 (28%) addressing well-being comparisons of high versus low tracks, 6 of 25 (24%) observing implications that tracking has for the students' sense of belonging and social interactions and lastly 4 of 25 (16%) being concerned with increased stress levels found in high-tracks. The observations regarding the relationship between tracking and student well-being are summarized in table 5.

One paper that displayed the relation of tracking and the students' ASC was the literature review by Johnston and Wildy (2016). By evaluating student interviews and survey responses, they observed that low-track students' displayed decrease in ASC and reduced aspirations for future education. This could have a detrimental impact on their motivation and academic self-efficacy (Baines, 2019). Likewise, Taylor et al. (2019) that lower-track placements may lead to lower engagement and a decrease in confidence, which further perpetuates the students' self-doubt and lessens performance. Hornby and Witte (2014) conducted structured interviews with high school students in New Zealand. Based on their findings, they emphasized that ability grouping is often not only linked to lowered academic motivation, but also to an increase in behavioural issues in students, especially for those placed in lower tracks. This was especially pronounced in between-class tracking. The reduction in motivation can be explained by a perceived lower status of the students as well the expectations that are associated with lower tracks. Additionally, Richardson (2002) underlined the effects that strict grouping practices can have on the psychological marginalization of students, especially for those that are already considered to be "at risk". This highlights that tracking may not only impact academic- but also social challenges alike.

Belfi et al. (2012) were not only concerned with the impacts on lower tracks, but also investigated what benefits it might have on higher-track students. The findings of their literature review suggest that, while students in upper tracks tend to have a higher overall well-being as well as a better ASC, lower-track students are more likely to experience a decline in their psychological well-being and ASC ($\beta = 0.31$ for track level predicting ASC). This pattern is again in line with the trade-off-like effect that tracking has also on academic success and on educational equity, in which it may benefit students in higher tracks, but coming at the cost of detrimental impacts for low-track students.

It is also important to consider the influence tracking has on students´ sense of belonging and social connections in school and classroom environments. Low-track students often experience feelings of ostracization and exclusion from school culture. Ross and Harrison (2006) mentioned that low-track students have reduced motivation to engage in collaborative learning with other students and feel as though their peer status is lowered. This can lead to negatively impacting social bonds while increasingly detaching them from school. Additionally, Richardson (2002) stated that non-flexible grouping practices such as between-class grouping further isolates at-risk students which leads to less opportunities to interact with diverse peers, thereby reinforcing their labelled identities. Furthermore, the findings by Wilkinson and Penney (2024) suggest that students´ grouping preferences are often shaped by their own perceptions of fairness. These perceptions can have impacts on their identity, motivation and the quality of their interactions with other students.

Lastly, it is important to investigate how tracking increases emotional strain of students in higher tracks. Wu and Becker (2023) observed that academically selective and competitive environments lead to students reporting significantly increased levels of performance anxiety and stress, due to the high expectations put on them by teachers, parents and themselves. This idea was further supported by the findings of a study of Chessor and Whitton (2005). In the interviews they conducted with parents of students that are placed in gifted classes, they reported that some parents deemed these placements to have a negative impact on their children´s well-being and motivation. These effects were especially pronounced in children that did not thrive in these educational environments and often lingered – even when students transitioned to higher education.

Table 5

Summary of Findings for Student Tracking related to Student Well-Being

Subcategory	Key Findings	Relevant Papers
Academic self-concept	Lower in low tracks, higher in high tracks, resulting in decrease of motivation and academic outcomes for low-track students	Johnston & Wildy (2016); Taylor et al. (2019); Baines (2019)
Well-being high versus low track	Low track students worse ASC, motivation and sense of belonging, high-track students better off but experience academic stress	Hornby & Witte (2014); Richardson (2002); Belfi et al. (2012)
Belonging and peer interaction	Low-track students feel marginalized; strict grouping exacerbates isolation	Ross & Harrison (2006); Richardson (2002); Wilkinson & Penney (2024)
Emotional stress in high tracks	Performance pressure, anxiety and social stress more common in competitive high-track environments	Chessor & Whitton (2005); Wu & Becker (2023)

Discussion

4.1 Interpretation of Results

This review investigated the relationship that student tracking has with academic success, educational equity and student well-being. The observations indicate that the impact of tracking is uneven, since it tends to benefit high-track students while frequently disadvantaging low-track students. However, the effects are not consistent. Factors such as the timing of tracking, flexibility of movement between tracks, the students' socioeconomic-status and minority background, as well as tracking application variations (i.e. within-school versus between-school) are seen to mediate the effects.

For academic success, this review observes that high-track students are consistently at an advantage, especially due to access to better resources and higher-quality teaching. This implies that the success they experience may be less attributable to their actual abilities, but more so to the benefits that are associated with track placement. This leads to the question of

whether tracking actually lays the foundation for excellence or just skews the distribution of opportunity for students. Since the style and timing of tracking were observed to play a central role for the academic outcomes, especially for students in lower tracks, emphasizing to reconsider instructional designs, flexibility and a delay of tracking is essential.

The observations regarding eduactional equity suggest that tracking often functions more as a mechanism to reinforce existing social inequalities, instead of solely being an educational tool. The findings highlight the ongoing concern of disproportionately lower track placements for students that have a minority or lower SES background. Importantly, even when allocated to higher tracks, these students tend to not display academic growth which hints at underlying systemic issues that might be responsible, such as, for example, teacher biases.

In terms of well-being, the findings showed high-track students frequently reported better outcomes than their lower-track peers. However, the competitive environments and increased pressure through teacher and parental expectations that high-track students are exposed to can have negative implications regarding their stress levels and academic outcomes. Low-track students were often met with decreased expectations, identity issues and a lowered sense of belonging, which reaches far beyond academic metrics. Therefore, it is necessary for tracking systems to think about the development of a student beyond the scope of academic performances.

Tracking has shown to potentially benefit some students but frequently comes at the cost of endangering educational equity and well-being for others. The observations underline that not tracking itself, but more so when, how and where it is implemented, is deemed to be the central factor. Systems that aim to be flexible, transparent, and delayed tend to yield the best results for balance and inclusivity. Educational environments and policies need to

prioritize not only emphasize academic outcomes, but also mobility, fairness and the well-being of students.

4.2 Strengths and Limitations of the Included Studies

The reviewed papers display different methodological approaches, ranging from mainly quantitative to a smaller number of qualitative studies. Although this diversity broadens the review, it also complicates the comparisons drawn from different contexts and outcomes. The majority of studies focused on academic success, equity-related factors such as SES and race or the students' ASC. From a geographic point of view, western contexts (e.g. U.S., Germany, U.K.) are predominantly investigated which limits the generalizability, although findings from non-western countries provided similar findings. While the 25 papers cover a range methods and contexts which provides an important overview, it also showcases the need for more comparative designs that directly investigate tracking practices across diverse systems and populations.

4.3 Gaps in Literature and Future Research

Only a few studies were concerned with student perspectives which might lead to a lack of insight about how tracking is perceived and experienced by them. A study by Cardenal de la Nuez et al. (2023) showcases the importance of utilizing the students' perceptions in research regarding classroom environments and teacher relationships. Integrating interviews with the students' or self-reported data about their tracking experience may lead to a better understanding of how they perceive tracking on a personal and social level.

Furthermore, areas concerning the roles of teacher expectations and biases remain often unexplored. The findings from Cardenal de la Nuez et al. (2023) further suggest that teacher expectations are deeply intertwined with the students´ tracks placements and their predicted academic pathways. Lower teacher expectations are also linked to reduced student

performance and motivation, especially for disadvantaged groups. Future research could investigate the varying teacher expectations across tracks and what impact they have on structural inequalities.

4.4 Implications for Policy and Practice

The observations of this review propose a more cautious and thoughtful approach to tracking policies, since the ways of implementation may have unequal and lasting effects on students. 48% of the studies reported small potential benefits for high-track students regarding their academic achievement (average effect size d ≈ 0.25). However, most findings of this review suggest that there is a potential reinforcement of social stratification, limited opportunities (23 of 25 papers, 92%), decrease for academic outcomes (10 of 25 papers, 40%) and negative social and emotional impacts on well-being (12 of 25 papers, 48%) for students in lower tracks is echoed by most findings of this review. Educational systems should focus on delaying their tracking practices, increasing flexibility to move between tracks and warrant an equitable resource allocation for all groups.

The findings showed repeatedly that within-school tracking systems that employ more flexible grouping, and more tailored instructions tend to be more promising than their strict between-school counterpart, as seen by Cheung and Rudowicz (2003) who saw an effect size of (d = 0.19) on academic outcomes when comparing the two.

Additionally, instructors trainings should include raising the awareness of potential biases for placement decisions to reduce unjust track allocations for students. This should reduce the likelihood of students being placed in tracks based their backgrounds and let their ability become the deciding factor.

Lastly, tracking policies should always be shaped while accounting for student well-being, motivation and social inclusion, instead of only focusing on academic achievements.

By implementing these considerations, educational systems may be able to foster environments that promote excellence as well as equity in education, while also improving the students' well-being.

4.5 Strengths and Limitations

One key strength of this scoping review is its systematic and transparent methodology, guided by the PRISMA framework while applying it to two major databases. Including studies from several countries and precise methodological approaches made it possible to create a comprehensive overview of the relation that tracking has with academic success, educational equity and well-being. Thematically organizing the findings from multiple dimensions helped to increase the depth of analysis while allowing comparisons across different contexts.

However, it is important to acknowledge the limitations as well. In line with the procedure of scoping review methodologies, no formal quality appraisal of the included studies was conducted, which limits the assessment of evidence strength. However, effect sizes of the studies included were evaluated. Also, the review was strictly concerned with studies in the English language, thereby increasing the risk to exclude relevant research from non-English contexts. Furthermore, the scope of findings may have potentially been narrowed down due to only focussing on 2 databases for the collection. Another potential database to use could be Web of Science. Lastly, different types of tracking and their corresponding outcomes where investigated across the reviewed literature which may have affected the comparability of findings. Although the limitations were present, the review offers helpful insights into a policy-relevant and complex topic.

4.6 Conclusion

This scoping review investigated the relationship between student tracking and three educational contexts: academic success, educational equity and student well-being. It was found that tracking has the potential to enrich academic achievements for students, especially in higher tracks, but consistently indicated the opposite for their lower-track peers. The main points of concern were that it poses risk to the long-term opportunities and well-being of them, and that it may reinforce pre-existing inequalities. Reasons for these effects were the timing and ways of implementation, the flexibility of moving between different tracks, and the general social context of educational systems. A central idea that can be concluded after investigating the studies, was that tracking has profound implications for academic success, educational equity and student well-being- rather than just being a neutral organizational tool. Therefore, educational practices and policies have to go beyond the narrow focus on academic metrics and also account for more social and emotional impacts associated with tracking. Integrating flexible tracking designs, focussing on equity and paying more attention to the experiences of students are therefore key in creating better educational systems, thereby balancing excellence with fairness for all students.

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APPENDIX A

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	1
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	-
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	3,4,5,6,7,8
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	-
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	10
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the	10

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
		date the most recent search was executed.	
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	11
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	11,12
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	-
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	13
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	-
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	13,14
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	12
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	-
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	-
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	15,16,20,23,24
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	-
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	26,27
Limitations	20	Discuss the limitations of the scoping review process.	30
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	33,34
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	-

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMAScR): Checklist and Explanation. Ann Intern Med. 2018;169:467–473. doi: 10.7326/M18-0850.

APPENDIX B

Table 5

Overview of selected Studies

Author(s)	Key findings
Allende et al. (2024)	Between school tracking disadvantages low-track students, mobility is reduced by rigid tracking practices.
Baines (2019)	Lower track placements decreases ASC and motivation to pursue further education.
Belfi et al. (2012)	High-track students experience better well-being whereas low-track students have a decline in theirs.
Buttaro & Catsambis (2019)	Early tracking predicts worse outcomes overall, but low-track students are affected more.
Chessor & Whitton (2005)	Gifted children have a higher likelihood to experience increased stress.
Cheung & Rudowicz (2003)	Students with disadvantaged backgrounds are predominantly placed in lower tracks.
Hallinan (2003)	Low-track students have worse instruction, lowered expectations, a decline in ASC which leads to worse outcomes.
Hallinan (2000)	Low-track students consistently performed worse than high-track students, regardless of initial ability.
Hornby & Witte (2014)	Low-track students have more behavioural issues and less academic motivation, esp. in between-class tracking.
Ireson et al. (2002)	Students who had lower prior academic success had more progress in mixed-ability groups.
Johnston & Wildy (2016)	Students with disadvantaged backgrounds are disproportionately placed in lower tracks.
Khazaeenezhad et al. (2012)	Argue that there are no significant academic differences between track levels and that is likely to be moderated by the implementation techniques of institutions and systemic factors.
Knigge et al. (2022)	Low-track students had less mobility and opportunities to change their situations, thereby reinforcing inequalities.
Liem et al. (2015)	Low-track students have worse instruction, lowered expectations, a decline in ASC which leads to worse outcomes.

Livingston (2010)	Growth of students with low SES is hindered even in high track placements
Macqueen (2011)	Students with disadvantaged backgrounds are disproportionately placed in lower tracks, reinforcing inequalities.
Nomi (2009)	Suggested that students in more de-tracked environments showed higher aspirations to partake in tertiary education.
Preckel et al. (2017)	Track placements are often interacting with the students' ASC, more so benefitting high-track students.
Richardson (2002)	Argued that structural factors such as low SES, racial segregation and uneven access to resources reinforce structural disparities.
Ross & Harrison (2006)	Argue academic advantages may be related to instructional quality and is unevenly distributed among tracks.
Steenbergen-Hu et al. (2016)	Flexible within-class grouping approaches tend to yield the academic outcomes, especially for low-track students.
Taylor et al. (2019)	Suggest that subjective track-allocation-benchmarks teachers have for students may be hindering the schools attempts to improve equality.
Wilkinson & Penney (2024)	Suggest that students' grouping preferences are often shaped by their own perceptions of fairness and that the perception often impacts on their identity, motivation and peer interactions.
Woods (2023)	Underlines the negative consequences associated with early misplacements and how it may be more easily negated through better permeability between tracks.
Wu & Becker (2023)	Observed that academically selective and competitive environments lead to students reporting significantly increased levels of performance anxiety and stress.

Acknowledgement of AI Usage

AI tools such as ChatGPT and Grammarly were used during writing process of this thesis. They were solely used to improve grammar, readability, structure and coherence. They were not used to generate content, analyse data or interpret findings. Any conclusions, critical evaluations or intellectual contributions presented were the sole work of the author.