Teachers' goals and strategies for classroom seating arrangements: A conceptual qualitative replication study

Student: B. Sprang (s4527984)

Supervisor and first assessor: dr. S. M. Field

Second assessor: dr. M. Lopez

Rijksuniversiteit Groningen

Faculty of Behavioural and Social Sciences

Bachelorthesis Pedagogische Wetenschappen

June 2025

Number of words: 7997

Abstract

This conceptual replication study explores Dutch elementary school teachers' goals and strategies for classroom seating arrangements, building upon a previous study by Hoekstra et al. (2023). Using semi-structured interviews with four Dutch elementary school teachers in Groningen, this study reinterprets the original 11 themes, while also interpreting two additional themes: *teacher experience and classroom manageability,* as well as *techniques for constructing seating arrangements*. Results show that teachers intentionally adapt strategies to meet the needs of both individuals and the group, balancing academic, social-emotional, group functioning and classroom manageability goals. Teachers keep multiple goals in mind when designing their seating arrangement and use various strategies to achieve various goals. The findings contribute to broader theory development on classroom management and teachers' goals and strategies for seating arrangements. Keywords: classroom seating arrangements, teacher goals, teacher strategies, classroom management, qualitative replication study, elementary education.

Introduction

Theoretical background

Teachers play a crucial role in shaping students' wellbeing, social and academic development, and peer relationships within the classroom (Hoekstra et al., 2024; Van Den Berg & Cillessen, 2014). According to Farmer et al. (2011), *"(…) teachers are the one professional in a child's life who have the opportunity to view the whole child in relation to the social ecology in which he or she is embedded"* (p. 1).

This perspective aligns closely with Bronfenbrenner's ecological systems theory, which conceptualises human development as embedded within a series of interrelated environmental systems (Purkait, 2024). The model describes five systems which influence the individual within the context of human development. The individual is placed at the centre with the five systems encircling them. Most relevantly, the mesosystem contains the direct contacts of the individual, including the school environment, teachers, and peers. Student well-being is strongly influenced by the interactions they have within this system surrounding them (Łukasik, 2021; Purkait, 2024).

This demonstrates that teachers have the capability to shape the classroom's peer ecology. Research has shown that classroom seating arrangements can impact topics such as social dynamics, peer status, positive engagement, and social positioning (Farmer et al., 2011; Van Den Berg & Cillessen, 2014). The physical space and environment can affect the attitudes of both teachers and students; changing the environment of the student can be a

strategy to decrease disruptive behaviour (Simmons et al., 2015). Additionally, research has shown a correlation between students' academic performance and their classroom seating position (Rogers, 2020).

This brings teachers to the important decision of where to seat their students. Requiring the balance of both the individuals' and the group's academic and social-emotional needs in their decisions, teachers consider designing the seating arrangements challenging and complex (Hoekstra et al., 2023). However, teachers receive little training and education on this topic (Simmons et al., 2015).

Prior research

Interestingly, most of the existing research on students' behaviour, academic development, and wellbeing in the classroom environment has placed more importance on affecting factors in the classroom environment other than classroom seating arrangements (Haghighi & Jusan, 2012). Moreover, empirical evidence on the effectiveness of specific strategies, such as pairing students, separating students or seating students in specific areas of the classroom, remains limited. For example, studies showed no effect of placing a victimised student next to a best friend or distancing them from a bully has shown no significant effect on student wellbeing (Hoekstra et al., 2024).

Furthermore, studies have found unclear results on which strategies or seating arrangements are preferred by teachers and students (Rogers, 2020; Simmons et al., 2015). The most efficient seating arrangements appear to depend on multiple factors, such as the goals of the teacher, students' individual needs, group characteristics and the subject being taught (Simmons et al., 2015).

This gap in the literature is reflected in Farmer et al.'s (2011) reference to Dr. Carins' "invisible hand theory", which illustrates the limited attention paid to teachers' influence on shaping the social dynamics and peer relationships in their classroom. The lack of research in this area is well shown in the context of classroom seating arrangements.

Although Bronfenbrenner's ecological systems theory highlights the teacher's influence on student well-being and development through interactions within the mesosystem, current research still lacks clear guidance on which seating strategies best support various goals (Farmer et al., 2011; Van Den Berg & Cillessen, 2014; Łukasik, 2021; Purkait, 2024).

As such, it is important to develop a clearer understanding of the strategies teachers use when assigning seats and the goals they aim to achieve. To address this gap in the literature, Hoekstra et al. (2023) conducted a qualitative study titled *"Teachers' goals and strategies for classroom seating arrangements: A qualitative study"*, published in *Teaching*

and Teacher Education. The goal of the study was to gain a deeper understanding of teachers' decision-making processes regarding classroom seating arrangements. Specifically, the study aimed to answer the following question: *What do teachers aim for and how do they try to achieve this when creating seating arrangements?*

Through interviews with 13 elementary school teachers, the study interpreted 11 themes – 3 related to teachers' goals (e.g., students' social-emotional functioning and group functioning) and 8 to their strategies (e.g., mixing gender, weighing and prioritising and pairing students). By distinguishing between goals and strategies, the study aimed to understand potential differences and similarities among teachers. Given that effective seating arrangements are often shaped by the specific goals teachers aim to achieve, studying both their goals and strategies is essential for understanding effective seating arrangements. (Simmons et al., 2015; Hoekstra et al., 2023).

Rationale for replication

According to current literature, strategies for classroom seating arrangements should be examined across diverse contexts to evaluate their relevance and effectiveness for broader educational populations (Hoekstra et al., 2024). In this context, replication studies are particularly valuable. They can help determine whether the findings of an original study are context-dependent, shaped by factors as time, location, or the individuals conducting the study, or whether they represent generalisable insights (Schmidt, 2009). Thus, replication contributes to a better understanding of how educational phenomena interact with contextual variables and can provide more transparent research (Schmidt, 2009; Makel et al., 2022).

Replication is particularly relevant in qualitative research when it aims to support theory building and elaboration (Makel et al., 2022). Furthermore, the theoretical significance and relevance of a study are essential criteria in determining whether it is suitable for replication (Field et al., 2019). Current research highlights a clear need for deeper insight into which strategies are effective, under what conditions, for which goals and for whom, to create successful practical classroom guidelines for teachers (Hoekstra et al., 2023; Hoekstra et al., 2024; Simmons et al., 2015). This emphasises the theoretical value of conceptual replication in contributing to theory development in this area. By replicating the original study with a similar sample - Dutch elementary school teachers in a different province – this study enables comparison with the original study and contributes to the development of more generalisable insights across Dutch elementary school contexts.

Research Aims and Questions

Accordingly, this replication study aims to expand existing knowledge on teachers' goals and strategies for classroom seating arrangements by exploring potential similarities and differences to the original study in a new sample and context. A conceptual replication will be conducted to address the following research questions: *What are teachers' goals and strategies regarding seating students in Dutch elementary schools in Groningen? How do these goals and strategies compare to the original study's findings?* By applying the same methodology and interview protocol with a new sample in a different context, this study enables a comparison with the findings of Hoekstra et al. (2023), thereby contributing to a broader understanding of this topic. It is expected that goals and strategies interpreted by Hoekstra et al. (2023) may be re-interpreted in this replication study. However, new goals and strategies may also be interpreted, thereby contributing to a deeper and more generalizable understanding of teachers' goals and strategies for creating classroom seating arrangements.

Method

This study employed a conceptual replication to explore the following qualitative research questions: *What are teachers' goals and strategies regarding seating students in Dutch elementary schools in Groningen? How do these goals and strategies compare to the original study by Hoekstra et al. (2023)?* By applying the original methodology and interview protocol to a new sample in a different context, this replication aims to provide a deeper understanding of this area.

Recruitment and participants

Participants were recruited via convenience sampling to allow the collection of in-depth data from relevant and available participants within the timeframe of the study. Approximately sixty Dutch elementary schools in Groningen and the northern region of Drenthe received an email invitation to participate. Administrators from three schools expressed interest and selected one or two teachers. Teachers were selected based on their availability and voluntary participation and were required to have experience in designing at least one seating arrangement during their careers. Ultimately, four teachers participated. Two teachers were in the classroom with an intern, and one teacher with an assistant teacher. During the first interview, an intern was present and briefly shared his classroom experiences. His input was limited to contextual background and was not analysed independently. Other interns and assistant teachers were not included in the interviews. All four teachers had experience independently designing at least one seating arrangement. Two of the teachers taught the eighth grade, one taught the sixth grade, and one taught the fourth grade of the elementary school. The first and third teachers taught at a public elementary school, and the

second and fourth at a culture-focused elementary school. The sample consisted of two female and two male teachers, all of whom had multiple years of experience teaching. Participation was voluntary, and all participants provided verbal informed consent before the interview.

The participant characteristics were aligned with those of the original study, including years of teaching experience and responsibility for classroom layout. However, two out of four teachers taught the eighth grade, whereas the original study's sample contained grade four, five, and six teachers.

Procedures

Interviews were conducted during the final semester of the 2024-2025 academic year. A total of one hour and 40 minutes of audio was collected through four interviews, with the interview durations ranging from 18 to 29 minutes. To ensure consistency with the original study, the interviews were conducted one-on-one at the teachers' schools, and the setting and procedure were kept as neutral and non-directive as possible. Semi-structured interviews were conducted in Dutch, using the original interview format and questions developed by Hoekstra et al. (2023).

All four interviews were audio-recorded with participants' consent and transcribed verbatim for analysis. Pseudonyms were used in the transcripts and reporting to protect participant anonymity. The study procedures were approved by the Ethical Committee of the University of Groningen.

At the beginning of each interview, participants were asked to present a map of their current seating arrangement. This was followed by general questions about how and why the arrangement had been created in that way, and how frequently changes were made during one school year. An example question is *"What were your most important considerations for designing the seating arrangement as it is now?"*.

The second part of the interview focused on various types of students and the strategies used to assign them seats. Questions explored teachers' perceptions of how seating affects students' social and academic behaviour, as well as overall group dynamics. Examples of questions include *"To what extent do you take into account specific 'types' of students (e.g., students who show disruptive behaviour, students with physical problems, students who are victimised) in your arrangement?"* and *"Do you think the classroom seating arrangement can impact the dynamics of the group and the way students interact with each other?"*.

Finally, teachers were asked what advice they would offer novice teachers regarding seating arrangements, and what they believe is still missing in current literature. Follow-up

questions such as *"Why or why not?"* and *"How do you notice this effect?"* were used to gain deeper insight.

Data analysis

All interviews were transcribed verbatim and analysed using a phenomenological approach, consistent with the method employed by Hoekstra et al. (2023). This approach seeks to understand participants' lived experiences of a phenomenon by allowing them to express those experiences in their own words, thereby supporting theory development (Lewis, 2015; Creswell, 2013; Flowerday & Schraw, 2000).

The phenomenological analysis followed four main steps; bracketing (*clarifying the position of each researcher in the study*), intuiting (*immersing in and grasping participants' meanings*), analysing (*organizing and coding the data into meaning units, revealing the importance of the experience*) and describing (*capturing the essence the essential experience of the phenomenon)* (Greening, 2019). This approach was selected to gain a deep understanding of how teachers experience, apply and interpret strategies and goals when designing classroom seating arrangements.

Two student researchers conducted and transcribed both interviews. The four transcripts were then shared between the two students, who then individually continued the analysis of all four transcripts. The data was coded using Atlas. Before the analysis, both researchers reflected on their assumptions and prior experiences with classroom seating arrangements.

During the intuiting phase, each transcript was read closely, and significant statements related to the research question were highlighted. Eventually, 279 statements were identified, reflecting the teachers' goals and strategies for classroom seating arrangements.

In the analysis phase, the highlighted statements were grouped into meaning units, representing more general interpretations of teachers' experiences of goals and strategies in the statements. Eventually, 91 meaning units were created.

Subsequently, the meaning units were clustered into themes. As a starting point, the coding framework used by Hoekstra et al. (2023) was applied, which consisted of 11 themes (3 goals and 8 strategies). However, new themes that were interpreted from the data were also included, in line with the exploratory and theory-building nature of this replication study.

After interpreting the themes, they were subsequently compared with the findings of Hoekstra et al. (2023) to evaluate both similarities and potential extensions of the original framework. Although data saturation was not formally assessed due to the limited sample size, each interview yielded rich and detailed data aligned with the research aims.

Results

Through the analysis of the four interviews, the same 11 themes as reported in the original study were interpreted, of which 3 goals and 8 strategies. In addition to these previously established themes, this replication study reveals two new themes. The first new theme addressed teachers' goals, "*Teacher experience and classroom manageability*", referring to the decisions the teacher makes to support their classroom management. The second theme addressed teachers' strategies, "*Techniques for constructing seating arrangements*", referring to the methods for designing seating arrangements.

Teachers' goals

Theme 1: Academic functioning (goal)

All four teachers mentioned considering both the individual's and group's academic functioning, independence, and development when creating seating arrangements. For example, they highlighted the importance of encouraging students' attention during instruction. Some teachers deliberately designed their seating arrangement so that students were facing the board and the teacher: *"(...) everyone's looking at the board, so that does something to the engagement – fewer distractions around you, and you always see the board where, you know, the instruction is being given"*. Additionally, teachers described supporting students' academic responsibility. One teacher explained: *"Sometimes two active children (...) of whom you know they talk a lot, I do sometimes give them a chance [to sit together], (...) they need to learn to align their behaviour with the rules in effect at that time"*. Participants also reported preparing students for future higher educational settings by encouraging autonomy in managing their learning context: *"(...) but sometimes I do try [to seat disturbing students together] so that they need to learn a bit more, that when it doesn't work, they can choose a different seat [to study at]"*. Teachers use seating arrangements not only to support immediate academic engagement but also to promote students' academic skills.

Theme 2: Social-emotional functioning (goal)

The four teachers reported using seating arrangements to support the social-emotional well-being of individual students, foster social skills, and promote collaboration with varying students. They aimed to strengthen students' self-confidence and support inclusion, while also offering students calm and safe positions within the classroom when necessary: *"[A student] that gets bullied obviously needs help and reassurance that [the student] is fun and that he can join [the group], so you seat him in a group or next to someone that [makes him feel this way]"*. Another frequently mentioned goal was to encourage students to collaborate with

other students outside of their immediate friend group: *"(...) and sometimes they just need to learn to work together with someone that doesn't fit them much, but that is part of the deal as well. (...) It's good for children to learn this"*. Another aspect of this goal was encouraging inclusion in the classroom: *"[I try to not always place lower-achieving students in the front of the classroom] otherwise you'll create a story like, I'm placed in the front because I'm not a good student. (...), so, I try to be careful with this and to sometimes place a higher-achieving student in the front of the classroom as well"*. All four teachers mentioned social-emotional functioning as a principal consideration.

Theme 3: Group functioning (goal)

All participants reported supporting the social cohesion, social dynamics, and social climate in their classroom. Teachers used seating to foster interaction between students who would not naturally collaborate: *"(...) like this girl is good friends with this girl, but I don't let them sit together throughout the whole year. I find it important that there are other contacts, that they realize they can work with other people and that other people are also fun"*. A few teachers also noted that such changes had positive effect beyond the classroom, which is what they aimed to achieve: *"Then you hear from parents that [students] play with other children who they would have never played with before"*. Moreover, teachers mentioned differences between lower grades (third, fourth and fifth) and higher grades (sixth, seventh, and eighth): *"This time I mostly let the children take the initiative [on deciding on the seating arrangements]. (...) I think this fits the sixth grade as well, that you can do this [letting students help decide on the seating arrangement] (...) so that they learn to make decisions in this [who students want to sit in groups with]"*. The teachers reported shaping the group dynamics, strengthening social cohesion, and promoting positive peer relationships in the classroom as important goals in their decision-making process.

Theme 4: Teacher experience and classroom manageability (goal)

In this study, three teachers also reported goals related to optimising their own experience and needs in the classroom, which influenced their seating arrangement decisions. This led to the interpretation of a new goal, which considered the teachers' experience and classroom manageability. Teachers indicated that certain seating arrangements, such as groups, made it easier to manage student behaviour and interactions, as well as to address the group effectively: *"[When tables were put into groups] it was very easy to address students, nobody felt directly pushed into a corner when [something was wrong and student's names has to be called in the classroom] and it's more fun to give compliments [in this way]"*. Teachers also mentioned they used specific arrangements during the first weeks with a new

teacher or intern, such as a two-by-two desk arrangements, facing the front of the classroom: *"I start at the beginning [of each schoolyear] in pairs, so that the students can get used to me and I can get used to the students, and so that they know exactly what I expect"*. They also mentioned separating students to make it easier to manage the classroom themselves. Optimising teacher experience and classroom manageability was mentioned as a goal in designing seating arrangements.

Teachers' strategies

Theme 5: Choosing a specific physical arrangement (strategy)

Teachers used various physical arrangements, such as rows, groups of four, groups of eight, and a U-shape. Teachers mentioned choosing rows to improve the academic focus in the classroom, to support mutual adjustment between students and the teacher at the beginning of the school year and for when there's a new intern in the classroom. For example: *"There are also lessons, mostly spelling, writing and maths, that I make rows (...). Those are the lessons for which the instruction is of great importance, and everyone needs to see [the board] well"*. They choose groups for collaboration, and one teacher uses a U-shape for lessons that require interaction and debates. Teachers often take students' preferences into account and discuss the physical arrangements with them: *"Now they really wanted a U-shape arrangement, because they saw this once when we were at [a different, secondary school] and they used this arrangement, so they asked if we could do this once"*. The teachers decide on the physical arrangement, considering the groups' needs and preferences as well as academic factors, such as the subject they're teaching at that time.

Theme 6: Mixing gender (strategy)

Teachers reported mixing gender as an important strategy to improve their students' collaboration with everyone and to ensure inclusion: *"They [the students] often sit together as boys and girls (...) and I notice boys and girls separating (...) in the eighth grade (...), but then they do play football together during breaks"*. Teachers mixed genders in their arrangements to improve collaboration and support inclusion.

Theme 7: Separating students (strategy)

Teachers used different strategies, considering separating students. One teacher did not separate students in cases of conflict to support them in solving issues. However, other teachers separated students, such as victimised and bullying students, to clear tension: *"Well, if I think, 'Hmm, there might be some tension here', then I'll seat one student over there and the other over here, with their backs to each other"*. Another teacher mentioned separating friends to enhance focus: *"The two students in front are seated together now, but this is risky*

because they can have too much fun together". Some teachers purposely separate students, but they do this carefully to support responsibility and inclusion for their students. Additionally, one teacher mentioned separating victimized and bullying students, to analyse their behaviour and the dynamics around other students: *"I think (...) it's good to not place them [the bullying and victimized student] next to each other, because then you can keep an eye on what happens, for example in [a different] group"*. Teachers reported using this strategy for various reasons and had different opinions on separating students.

Theme 8: Pairing students (strategy)

While some teachers intentionally separated students, others paired students for similar goals. As mentioned above, one teacher pairs students in conflict: *"But sometimes I do this [pairing students] on purpose, when children conflict (...), I seat them next to each other, so that they (...) have to get out of the conflict themselves"*. Some teachers paired higher- and lower-achieving students together, while also pairing students with similar cognitive abilities or interests. However, one teacher mentioned not purposely pairing or separating students to ensure inclusion and equality in the classroom: *"I'm not in favour of this, because I think you actually separate them this way, like, those are the smart students, so they're allowed to sit somewhere. And I think in that way you separate them from the group (...)"*. Some teachers mentioned pairing less popular students with popular students to strengthen their social position in the classroom: *"There are always children that get chosen a lot [to sit or play with other students], they might be able to bring along a child that finds this [social interactions] difficult"*. Teachers also mentioned pairing students outside of the seating arrangement, for example, as study buddies to work on certain tasks outside of the classroom. However, this strategy was used for various goals by teachers.

Theme 9: Seating students in specific areas or at specific distance to the teacher (strategy)

Teachers considered specific seats, locations, or distances to themselves when designing seating arrangements. Firstly mentioned were students who kept one seat throughout the entire school year: *"There are a few students for whom we've noticed that it's helpful for them to have a somewhat fixed spot [in the classroom]"*. Reasons for a fixed spot in the classroom included students with Attention-Deficit/Hyperactivity Disorder and Autism Spectrum Disorders, as well as those who were easily distracted or had other needs that required a fixed seat in the classroom. Moreover, students with visual difficulties were placed in the front of the classroom, facing the board. Teachers mentioned seating easily distracted students on the outside of the classroom, providing them with an overview of the classroom. They also reported seating students with visual difficulties or a Developmental Language

Disorder in front of the classroom, facing the board. However, the fourth-grade teacher mentioned seating independent students in the back and less independent students in front of the classroom: *"Children who sit further away from that table [the instruction table in front of the classroom], of whom you know you can let them go a bit more. And the children who are seated a bit closer, it's nice you can keep an eye on them, both in terms of behaviour, and learning"*. Other motivations for placing students in specific areas were mentioned, such as not always placing lower-achieving students in front, placing a victimised student close to the teacher, and seating resitting students in the same group at the beginning of the school year for a feeling of safety. Motivations and strategies considering seating students in specific areas or at specific distances to the teacher differed for every teacher.

Theme 10: Weighing and prioritising (strategy)

Teachers reported they had to prioritise and weigh the mentioned goals and strategies. Generally, the characteristics of the group, the subjects, students with fixed seats, the students' wellbeing and the social dynamics in the classroom generally held the highest value in the perspective of the teacher. As one teacher mentioned, *"And this [the current seating arrangement] also has a bit to do with the dynamics of this group. They are very focused on each other, so then you try – well, to remove some distractions by having them all face the board, and that definitely has a positive effect"*. Two teachers also reported using information from the class' last teacher at the beginning of the year to design the seating arrangement. All teachers also mentioned the difference between lower and higher grades: *"It [letting students take the initiative on new seating arrangements] also fits the sixth grade, I think (...), to learn to make choices in this"*, *"I think that in the third, fourth and fifth grade, you can have an influence [on the seating arrangement] as a teacher"*. Ultimately, all teachers mentioned that their classroom seating is shaped by intentional decisions.

Theme 11: Taking into account contextual factors (strategy)

The four teachers did not experience any contextual limitations in their classrooms. However, they used their contextual spaces as an addition to their seating arrangements. For example, teachers mentioned using separate rooms or spaces, outside of the classroom, where students can work on tasks: *"They are allowed to work with each other. We work with weekly tasks, and they're allowed to ask each other; 'Do you want to come with me? And then they can sit together in the hallway"*. Most teachers let students have a voice in the decision-making process: *"I let them decide with me (...) generally, I enjoy them having a voice in this [deciding on the seating arrangement]"*. All four teachers also used a separate table in front of the classroom for extra attention and instruction: *"I often use extended instruction, during*

which they sit here at the table [the extra table in front of the classroom]". Although teachers did not face contextual limitations, they used contextual factors to enhance their seating arrangements.

Theme 12: Changing arrangement (strategy)

The seating arrangements are often changed throughout the school year. One teacher changed the arrangement every Friday. Three teachers changed their seating arrangement after every holiday: *"We actually switch [the seating] around every school holiday, (…) about five times a year"*. Some teachers show the new seating on the school board, others lay the students' supplies at their new tables. Moreover teachers make small changes in between the complete changes of the seating arrangements, either by making changes in the seating arrangement: *"If I then think, (…) these two don't really match - not at this moment – then I do still adjust it [the seating arrangement] sometimes"*, or by temporarily seating the student somewhere else: *"There's always enough space, so when it gets to active and fun, I tell them to separate [the students] tables"*. Three teachers changed their seating arrangements after each school holiday, while one teacher did this weekly.

Theme 13: Techniques for constructing seating arrangements

While all four teachers employed distinct techniques in designing their seating arrangements, some also used specific methods beyond the interpreted strategies mentioned before. For example, one teacher described a unique approach in which the physical layout of the classroom was determined by the teacher, while the seating arrangement was randomized using a computer program: *"(…) in this way [designing the seating arrangement by letting a computer program decide randomly], [the student] actually do come together multiple times, and sometimes they sit together for a while, because (…) fate decides"*. This teacher changes the seating arrangement weekly and adds small adjustments to the seating arrangement when necessary, such as adding fixed seats or pairing students. The teacher used this method to enhance the social dynamics in the classroom: *"I gradually noticed that indeed the social structure, the cohesion and the atmosphere [in the classroom] improved enormously"*. In certain situations, such as a physical arrangement of a U-shape, this teacher also used another randomised method: sticks with all the students' names on them would be picked blindly by the students: *"Whenever we use a crazier physical arrangement, such as the U-shape, I use the name-sticks. I will hand them out and say [a students' new] 'this is your seat', etcetera"*. Additionally, randomised methods were used during any group activities, such as field trips or other projects: *"For Christmas (…) we make a Christmas dinner [in groups], which is also [arranged] using the same method. (…) all forms of collaboration; I organise this way. Even*

when we go on a field trip – I use the same approach for the car seating arrangement. (…)
you actually see it come back in everything, which shows that it [being seated randomly]
doesn't really matter anymore [to the students]". Another teacher mentioned that they
sometimes use this method for the seating arrangement, to enhance collaboration in their
classroom: *"(…) It's also really nice to let it happen a bit by chance, and to teach children*
how to get along with each other. (…) and it [randomizing the seating arrangement] just
happens automatically. There's no discussion about it either". This teacher mentioned using
this sometimes towards the end of the school year.

Another teacher used a questionnaire to gather information about students' seating
preferences, such as whom they want to sit next to and why. The teacher then entered this
information into a table that used colour-coding to visually represent the students' seating
preferences. This method was also used to strengthen the social cohesion and social dynamics
in the classroom: *"This [noticing a student who is rarely chosen as a seating partner] gives*
you a view of what you need to consider. How can I help this student make friends?".
Furthermore, two teachers reported using sociograms to visualise the social dynamics within
their classroom. This helped them identify patterns, such as friendships or isolation. Based on
the insights gained by the sociogram, they adjusted their seating arrangements. They aimed to
strengthen social cohesion and support inclusion of less integrated students: *"There are*
always children who get chosen [by other students for duo preferences] more often, maybe
they can easily bring along students who struggle with this". Some teachers suggested seating
children who got along well together, according to the sociogram; others recommended
pairing popular students with less popular students to enhance inclusion. Despite their
different forms, these methods were employed with similar underlying goals: to strengthen
peer relationships and the social dynamics of the group. Some teachers adopted elements from
both approaches, while others consistently implemented a single method across both
classroom and extracurricular contexts.

Interpretation of goals and strategies

Having outlined the thematic results, the interpretations presented below aim to gain an
understanding of their significance and explore what they suggest about teacher decision-
making on classroom seating arrangements.

Teachers reported making deliberate decisions when designing their classroom seating
arrangements, employing various strategies to achieve specific goals at the same time, related
to both the individual students' needs and group dynamics. They emphasised that classroom
seating arrangements influence both individual students and the group as a whole. Designing

these arrangements was described as a complex process, as teachers try to consider each student's unique needs and preferences. These goals and strategies changed throughout the school year. For instance, teachers reported using specific physical arrangements at the beginning of the school year to support mutual adjustment between students and the teacher. Towards the end of the school year, students were involved more in the decision-making process. Additionally, all teachers changed their seating arrangements multiple times a year: three teachers changed after each school holiday, while one teacher changed weekly. In addition, teachers reported making ongoing adjustments throughout the year, based on classroom developments or student behaviour.

Teachers reported various goals, such as academic, social-emotional, group functioning, and classroom manageability goals. However, academic goals were often reported to align with social-emotional and group functioning goals. For instance, most teachers mentioned not consistently seating lower-achieving students in a specific area in the classroom, to avoid exclusion or stereotypes. To balance both academic and social-emotional goals, they mentioned alternating between these goals. For example, they did this by placing both lower- and higher-achieving students in front of the classroom, to prevent negative labelling affecting students' wellbeing. Group functioning goals were frequently reported by all teachers, indicating that the group's social dynamics played a central role in the decision-making process. All teachers mentioned the group's characteristics as one of the primary considerations when designing the seating arrangement.

Moreover, a new goal was interpreted in this study. Three teachers mentioned considering their own teaching experience and the effect of seating arrangements on their classroom manageability. For instance, placing students in groups to address multiple students simultaneously instead of singling out a student who's showing disruptive behaviour, to prevent exclusion in the classroom. Teachers also mentioned considering the first weeks of an intern in the classroom as a consideration to choosing a physical arrangement of groups.

Hence, all teachers indicated that they considered multiple goals when arranging their seating arrangements, which confirms that the goals align with each other.

Strategies were reported differently by all teachers. Although some teachers employed different strategies to pursue similar goals, others applied similar strategies to achieve the same goals. In other cases, both goals and strategies were aligned among teachers. For example, while one teacher chose to separate students in conflict, others deliberately seated them together to encourage them to encourage resolution through peer interaction. Despite the different approaches, the underlying aim in both cases was to restore and maintain positive

peer relations. Some teachers seated disturbing students in the back of the classroom, whereas other teachers seated them near the teacher, with the common goal of maintaining a calm classroom environment. On the other hand, certain similar strategies were applied to achieve similar goals. For example, all teachers adjusted the physical arrangements based on group characteristics to enhance the group's functioning.

Furthermore, the strategy contextual factors (theme 11) did not pose any limitations for the teachers in this sample; they indicated that the available classroom space allowed flexibility in their seating arrangements. All teachers used extra spaces as an extension of their seating arrangements, by using an additional instruction table, tables in the hallway or separate rooms.

Moreover, one new strategy was interpreted in the data. Two teachers consistently applied specific techniques to design their seating arrangements. For instance, one teacher always applied randomised arrangements, and the other asked students for their preferences and used a colour-coded table. Other teachers used certain strategies inconsistently or used elements of these methods.

The reported strategies were not applied uniformly; they were adjusted to the characteristics of the class, some were used in combination, and they were used to achieve various goals. All teachers mentioned primarily deciding on the physical arrangement, then considering the students' individual needs, such as providing fixed spots (e.g., for students who benefit from consistency or students with certain learning disabilities) or seating students in fixed areas of the classroom (e.g., students who need an overview of the sides or students with visual issues in front). After this, goals were weighed and prioritised. Teachers mentioned discussing their designs at the start of the school year with teachers who taught the class the previous year. Moreover, teachers who had a teaching assistant in their classroom discussed their designs with the other professional.

Comparison to the Original Study

In addition to the 11 themes interpreted by Hoekstra et al. (2023), three overall patterns were also interpreted in their study: *"Across classrooms teachers seemed to have similar goals. Yet, teachers used different strategies to achieve similar goals. (…) [Secondly], teachers also used similar strategies to achieve different goals. (…) Third and finally, teachers adapt their goals and strategies to fit students' personal needs and those of the group"* (p. 7). As explained above, the interpretations in this replication study were in line with the overall patterns interpreted by Hoekstra et al. (2023). Moreover, Hoekstra et al. (2023) reported that teachers specifically used their seating arrangement to manage the social

dynamics in their classroom. This interpretation was strongly reaffirmed in this replication study. Teachers reported enhancing social inclusion and equality, the importance of collaboration among various students, enhancing the social cohesion and dynamics and supporting students in fragile social positions. Moreover, teachers mentioned that seating arrangements were a possible way to reduce interactions involving bullying. However, most teachers did not report that seating arrangements alone were a solution for bullying.

In this replication study, new insights were interpreted. For example, teachers reported considering the grade of their class in their decision-making process, with a difference in the decision-making process between lower and higher grades. Moreover, contextual factors weren't a limitation but an extension to their seating arrangements. In this sample, no teachers had to consider any students with physical disabilities, except for students experiencing vision difficulties.

Additionally, two new themes were interpreted in this replication study. The first theme considered the teachers' goal to support their own teaching experience and classroom manageability: *Teacher experience and classroom manageability* (theme 4). Two of the four teachers mentioned making decisions that were beneficial for classroom manageability, such as group arrangements or placing certain students in the back of the classroom. The second theme considered teachers' strategy of using certain techniques to design their classroom arrangements: *Techniques for constructing seating arrangements* (theme 13). Two teachers reported consistently using specific techniques to design their seating arrangements. One teacher used a randomised program to assign seats and implemented this throughout all collaboration projects, to enhance the social cohesion and dynamics and to teach all students to collaborate with various others. Another teacher reported handing students a questionnaire considering their seating preferences and then organising a colour-coded table, visualising which students wanted to sit next to or further away from which students. This teacher could then support the social cohesion, but also support children who students did not want to be seated with. Two teachers mentioned using a sociogram to visualise the social dynamics in the group, and most teachers mentioned using elements of different techniques.

Similar themes and overall patterns, as interpreted by Hoekstra et al. (2023), were also interpreted in this study. However, two new themes were interpreted, and reflecting on teachers' use of various strategies offered deeper insight into how and why these strategies were applied.

Discussion

This replication study aimed to examine teachers' goals and strategies for creating classroom seating arrangements. By conducting a conceptual replication, this study aimed to compare its interpretations with those of Hoekstra et al. (2023). A conceptual replication aims to examine whether the original interpretations are generalisable and whether they differ across factors such as sample, timing, and population (Perry et al., 2022). Furthermore, this replication study aimed to expand the gap of knowledge on the effect of the teacher on the classroom's dynamics, also called 'the invisible hand theory' (Farmer et al., 2011).

While the themes interpreted by Hoekstra et al. (2023) were largely re-interpreted, this conceptual replication also adds new insights to the existing literature on teachers' goals and strategies while creating seating arrangements. Similar to the original study, teachers aimed to enhance the social cohesion, social-emotional functioning, academic engagement and behaviour and meet the individual students' needs. Seating arrangements were often designed based on the group's characteristics, individual students' needs and the social dynamics in the classroom. The arrangements were changed either every school holiday or weekly, and teachers made smaller adjustments throughout the entire school year when needed.

All teachers mentioned considering multiple goals simultaneously, these were frequently intertwined. For instance, academic and social-emotional goals were often connected and influenced each other. Group functioning, such as the group's dynamics, was also often intertwined with individuals' social-emotional well-being. For example, teachers were always careful with seating academically lower-achieving students in front, to avoid segregation in the classroom based on academic results. They intended to prevent this, to enhance inclusion and cohesion in the group. This phenomenon has been shown in earlier research. Teachers base their decisions on their seating arrangements on a variety of goals, which differ depending on the classroom context and the individual characteristics of their students (Gremmen et al., 2016). Multiple goals were considered by teachers at the same time, and various strategies have been reported to achieve these goals.

Moreover, two new themes were interpreted. Teachers mentioned considering their classroom manageability and their own teaching experience when creating seating arrangements, which led to a new goal: *Teaching experience and classroom manageability*. Secondly, teachers reported using specific techniques to design their seating arrangements. A new strategy was interpreted concerning this topic: *Techniques for constructing seating arrangements*.

However, in this study, certain interpretations by Hoekstra et al. (2023), were not re-interpreted, such as considering limiting contextual factors and students' physical disabilities.

This study adds to the existing body of knowledge on how classroom seating arrangements reflect teachers' broader pedagogical goals and classroom management strategies by offering new perspectives on how teachers apply strategies to achieve various goals.

Limitations and future directions

This study conducted a conceptual replication study. However, due to time limitations, the sample contained four teachers, whereas the original study studied a sample of 13 teachers. For this reason, it's possible that certain interpretations from Hoekstra et al. (2023) were not re-interpreted in this study, such as students' physical limitations or contextual limitations. The key limitation of this study - a sample size of four teachers – might be a limitation to the comparability with the original study. Additionally, the results reflect the specific experiences of the sample and may not represent teachers' goals and strategies across different schools or regions. On the other hand, although the small sample size limits generalisability, it allowed in-depth engagement with each teacher. It enabled the researcher to conduct a thorough analysis and understanding of the teachers' experience of designing seating arrangements.

Furthermore, the use of a convenience sample may have contributed to self-selection bias, limiting the representativeness of the interpretations. For instance, two teachers had specific techniques for designing seating arrangements, which may have been the reason for their interest in participation. Participants' willingness to participate may not reflect a broader population of elementary school teachers. However, this sample did offer new insights on possible effective strategies, since they designed their method based on their own teaching experience. The use of a convenience sample may limit the generalisability of the findings, yet this sample also offered insights into new strategies and techniques.

In this study, teachers mentioned the potential different strategies used in different grades. The findings of this study might not represent the goals and strategies of teachers in all grades, which highlights the need for future research in this area.

Moreover, the goals and strategies have only been discussed with teachers. They reported that they noticed positive effects of their strategies for both individuals and the group, such as for social cohesion in the group. For example, teachers mentioned seeing their students learning to collaborate with various other students after applying their strategies. However, the experiences of the students have not been involved in this study. Exploring teachers' strategies for classroom seating arrangements from the students' perspective might provide new insights.

Since two teachers reported using specific techniques for designing their seating arrangements, i.e., randomised groups and seats, students' questionnaire and colour-coded tables, and the use of sociograms, exploring these strategies one-by-one might provide an understanding of specific methods and strategies that teachers could use. Specifically, the teacher who applied the randomised groups in all collaboration projects and arrangements described having specific goals in mind when applying this strategy. Moreover, this teacher reported achieving goals which all teachers intended to reach. As previously stated in the introduction of this study, the effects of specific strategies remain unclear in the current literature (Hoekstra et al., 2024). For this reason, studying the effects of specific strategies that teachers reported using could add to the existing body of knowledge on seating arrangements.

This study highlights the importance of seating arrangements as a strategic tool for teachers to achieve various goals. Regularly changing the seating arrangement throughout the school year may support positive group dynamics, enhance social cohesion, and promote inclusion. Tools such as sociograms and student questionnaires can help visualise social dynamics within the group, and randomisation programs may support social inclusion and collaboration among various students.

Teacher training could benefit from more attention to seating strategies, ultimately contributing to the development of practical guidelines. This could help teachers effectively address both individual student needs and overall group functioning.

Furthermore, future research could examine the effects of using randomisation programs, sociograms and student questionnaires to support teachers in designing seating arrangements that enhance social inclusion, improve group dynamics, and meet individual needs. Finally, future research could focus on investigating differences in seating strategies between lower and higher grades, as this study interpreted potential differences across grade groups.

Through discovering new themes such as teacher manageability and methodological techniques, this study offers new insight into how teachers influence the classroom's social dynamics. It demonstrates that seating arrangements are guided by intentional strategies aligned with teachers' academic, social-emotional and group functioning goals. These interpretations underline the need to view classroom seating arrangements as a meaningful pedagogical practice and call for further theoretical exploration in this area.

Conclusion

This conceptual replication study interpreted four teachers' goals and strategies when creating their classroom seating arrangements and compared these interpretations to the results of the original study by Hoekstra et al. (2023). Teachers' goals and strategies were explored, using the eleven themes interpreted in the original study. All themes were re-interpreted in the replication study, including two new themes: *Teaching experience and classroom manageability* (goal) and *Techniques for constructing seating arrangements* (strategy). None of the teachers had to consider contextual limitations or students with physical disabilities, contrary to the original study. Corresponding to the original study, some teachers had similar goals and used the same strategies to achieve them. Other teachers used similar strategies to achieve different goals. Teachers adapt their strategies to the grade of the group, the group's characteristics, and the students' individual needs. The findings of this study provide an expansion of the findings of Hoekstra et al. (2023), contributing to the understanding of teachers' manageability concerning classroom seating arrangements.

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