Culturally responsive teaching in Dutch multicultural secondary schools

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Chapter 3

Noticing through a cultural lens: Student teachers' and expert teachers' identification and interpretations of events in a multicultural classroom context

"It is almost too obvious to say that what is not noticed cannot be acted upon."

--- Mason (1996, p.6) ---

Abstract

Noticing is an important skill for adequate classroom management. In a multicultural classroom, teachers not only need generic noticing skills, but also noticing skills that consider students' cultural diversity. In this explorative study, we call the latter 'noticing through a cultural lens'. Noticing through a cultural lens is examined for both student teachers and expert teachers. Spherical Video-Based Virtual Reality (SV-VR) clips were used that were watched with a Head Mounted Display (HMD). Participants then completed a questionnaire with open questions. Most identified events in both participant groups were the events that involved student movements, and students' use of cell phones. None of the student teachers or expert teachers interpreted the identified events in the SV-VR clips through a cultural lens. In both participant groups interpretations of the identified events mainly referred to student learning and student interactions.

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3.1 Introduction

Classrooms are highly complex environments characterized by multidimensionality, simultaneity, and immediacy (Doyle, 1986; 2006). Multidimensionality refers to a variety of events that occur in a classroom at the same time, such as events related to student behaviour, students' learning processes, peer interactions, and relations between students and the teacher. These events occur simultaneously, and to be able to respond accurately, teachers must first identify which events they consider important to address and how they can adequately interpret those events. This process of identifying and interpreting significant classroom events is called *noticing* (König et al., 2022; Sherin & Russ, 2015; Van Es, 2011; Van Es & Sherin, 2002) and is an important skill for adequate classroom management.

Regarding noticing in a multicultural classroom, critical race theorists (Banks, 1993; Gay, 2006; 2010; 2018; Ladson-Billings, 1995; 2006; Weinstein et al., 2003; 2004) argue that, in addition to generic noticing skills, teachers also need to consider students' cultural diversity when identifying and interpreting classroom events. For example, a teacher could interpret quiet and obedient behaviour as insecure but when looked at through a cultural lens, they might consider whether this could be a valued quality in the student's home culture (Weinstein et al., 2003). To give another example, a teacher could interpret off-task behaviour as disinterest on the part of the student but when looked through a cultural lens, it might be that the student did not understand the instruction because of his language background, or because the examples did not fit with his cultural background. Although in general, a diverse classroom might be an enriching learning environment where students of different cultures can learn to respect and interact well with each other (Thijs & Verkuyten, 2014; Verkuyten & Thijs, 2002), students can also make subtle hurtful discriminatory comments to each other based on perceived differences. If teachers in multicultural classrooms can notice through a cultural lens as well as interpreting from different educational perspectives, they can pave a way for culturally responsive teaching. This means considering and using students' cultural frames of reference in teaching and

classroom management to give all students equal opportunities to succeed and excel (Gay, 2006; 2010; 2018; Weinstein et al., 2003; 2004).

Although many studies have examined content-related noticing (König et al., 2022; Stahnke et al., 2016) and differences in generic classroom management noticing between novice teachers and expert teachers (König et al., 2022; Wolff et al., 2016; Wolff et al., 2017; Wolff et al., 2021), to the best of our knowledge, no research has been conducted on generic classroom noticing through a cultural lens comparing student teachers and expert teachers. The purpose of this study was to explore this untapped area for both student teachers and expert teachers, to gain insights into classroom noticing through a cultural lens.

3.2 Novice teachers' and expert teachers' noticing of classroom events

Evertson and Weinstein (2006, p. 4) describe classroom management as 'the actions teachers take to create an environment that supports and facilitates both academic and social-emotional learning'. In order to create such an environment, it is essential that teachers notice events in the classroom. Teacher noticing had been defined in the literature in a variety of ways (König et al., 2022), but all definitions include at least two key processes: (1) the identification of relevant classroom events; and (2) the interpretation of what is identified by knowledge-based reasoning (Sherin et al., 2011; Van Es & Sherin, 2002). Identification of classroom events does not refer simply to awareness of a variety of events in class but to paying selective attention to events perceived as relevant (Sherin & Russ, 2015). Interpretation refers to how teachers make sense of what they have identified (Sherin & Russ, 2015).

Regarding the identification of classroom events, previous research (Chi, 2006; Wolff et al., 2015; 2017) has revealed that expert teachers can identify relevant information and typical events significantly more often and faster than novice teachers. They are able to identify relevant details that novice teachers often do not see.

Eye-tracking research has also explored differences in fixation dispersion between these teacher groups. For example, Stürmer et al. (2017) found that novice teachers distribute their attention across only a few students while teaching. Comparing partner work and whole-class instruction, Stahnke and Blömeke (2021) found that in the partner work condition expert teachers noticed more events than novice teachers.

Identifying relevant classroom events is the first step in noticing. The interpretation comes after that. Each event in the classroom can be interpreted from many different perspectives and in many ways. A yawning student, for example, can be interpreted as tired because he slept badly because of a noisy and disturbing home situation or because he gamed too long the night before, or as disengaged because the subject matter does not interest him or is too difficult or too easy for him. Interpreting classroom events requires professional knowledge, that is knowledge about both general principles of learning and teaching and the specific teaching context, such as knowledge about the students, curriculum, school, home situation, etc. (Sherin & Van Es, 2009; Sherin & Russ, 2015; Wolff et al., 2021). Wolff et al. (2021) refer to this latter, more specific and situated knowledge, as *scripts*.

Expert teachers have more scripts at their disposal than novice teachers so they can interpret events in a top-down, *knowledge-driven* way (Wolff et al., 2016; 2021) making them able to process what they identified more effectively (Wolff et al., 2015). In contrast, novice teachers predominantly process what they perceive bottom-up, which is called *image driven* (Wolff et al., 2016; 2021). A major finding from the studies of Wolff et al. (2015; 2017) regarding differences between expert teachers and novice teachers' representations and interpretations of classroom management events was that expert teachers interpreted events more as student learning or lack thereof and novice teachers as student discipline. Moreover, expert teachers interpreted more elaborately than novice teachers.

With respect to noticing classroom events through a cultural lens in multicultural classrooms, we cannot draw on previous research. However, we can formulate some expectations based on the insights outlined above. We assume that teachers who have gained expertise in multicultural classroom contexts will

have built multicultural scripts and thus are probably able to interpret events through a cultural lens. In contrast, novice teachers usually have few or no scripts available for multicultural contexts and so may not be able to interpret classroom events through a cultural lens. Furthermore, looking through a cultural lens in an image-driven way could lead to identifying superficial differences between students, such as skin colour or way of dressing, which could lead to stereotypical interpretations of students' characters or academic potential (Weinstein et al., 2003).

3.3 This study

The main purpose of this study was to gain insights into how expert teachers and student teachers notice through a cultural lens in a multicultural classroom context. Understanding the differences between student teachers and expert teachers regarding this particular form of noticing could inform student teachers' expertise development in that area.

Three research questions guided this study:

1. Which events do student teachers and expert teachers identify in a multicultural classroom context?
2. What culture-specific interpretations do student teachers and expert teachers give to events in a multicultural classroom context?
3. How do student teachers and expert teachers differ in the way they identify and interpret events in a multicultural classroom context?

We used Virtual Reality (VR) technology with 360-degree videos. This is known as spherical video-based VR (SV-VR). The videos were viewed with a head-mounted display (HMD) to present participants with real-world video clips of multicultural classrooms. In this way, we provided an immersive experience in an authentic and realistic environment (Araiza-Alba et al., 2022; Ferdig & Kosko, 2020).

3.4 Method

3.4.1 Participants

The participants were 25 student teachers and 10 expert teachers teaching different school subjects. The student teachers were following a four-year teacher education program in the Netherlands, which prepares students to teach one school subject in secondary education. The expert teachers taught at the same multicultural urban school in the Netherlands and had at least 3 years of teaching experience at a multicultural school.

Female student teachers accounted for 52% of the student teachers (n=13) and 50 % of the expert teachers (n=5). The average age of the student teachers was 24.4 years (*SD* = 8.55). Three student teachers who differed significantly from the average age were 38, 42, and 56 years old. These participants were second-career students who had chosen to become teachers after careers in other fields. The average age of the expert teachers was 40.8 years (*SD* = 6.4).

Student teachers were recruited by approaching their practice schools and expert teachers by approaching the school coordinator of the urban school from the first author's network. All participants were informed by email about the study and about voluntary participation. The study was designed as a workshop. At the start of the meeting, the researchers repeated the information about the study and voluntary participation. All participants signed an informed consent form. The study was carried out with the permission of the ICLON ethics committee with number IREC_ICLON 2019-13.

3.4.2 Procedure

Three spherical video-based VR (SV-VR) clips of approximately two minutes were developed and installed on 20 HMDs (Oculus Go). Viewing the clips with an HMD allowed participants to have a completely individual experience unhindered by distractions from the 'real' environment. Moreover, to make the experience even more immersive and authentic, the clips were recorded from a first-person point of view, which means that the participant was the teacher in the clips who watched the class from a central position.

The scenes in the clips were played by 23 actors aged about 16 years from different cultural backgrounds. The actors played themselves in a common Year 10 multicultural classroom. Some actors were given instructions to play a role regarding specific classroom events. The events included, for example, some students using their mobile phones, wearing earbuds, wearing a cap and/or jacket, having a bag on the table, and being on- or off-task. In addition, each video clip contained a more conspicuous trigger, related to movements: in clip 1 a student at the back moved to a group at the front of the classroom and a wad of paper was thrown; in clip 2 a student walked to the teacher's desk to get a dictionary and another boy screamed to him to take one for him too; in clip 3 a boy left the classroom without asking and two girls (wearing headscarves) who were sitting in the same table group turned around and started talking to a girl (not wearing a headscarf) at another table group. Because of the visible cultural diversity in the class, each event could have been interpreted through a cultural lens. For example, the boy who left his place and joined another group might have had a problem with the students he had to work with because of cultural differences or he might have been seeking out students with a similar cultural background to work with; the girls with headscarves might have had strong religious feelings about the girl without a headscarf and have been challenging her for her poor observance of her religion; the boy might have been going to get a dictionary because he had limited Dutch vocabulary because another language was spoken at home. Some events were based on previous research regarding issues that jeopardize the sense of community in multicultural classrooms (Gaikhorst et al., 2017; Leeman, 2006; Radstake, 2009; Tielman et al., 2022; Verkuyten & Thijs, 2002) and on examples from interviews conducted with expert teachers from multicultural secondary schools (Theeuwes et al., 2019).

At the start of the research process, participants were instructed about the use of the HMD and introduced to the study:

> *'You are the teacher of a Year 10 multicultural class, and, during a mentoring hour, you have been teaching about drug use. When you enter the simulation, you have just explained the assignment. Students have received a text about drug use among young people and they have been asked to discuss this text with*

each other. Each clip is a new situation and therefore the clips do not build on each other. You are standing in front of the class to oversee the students while they are doing the assignment in their table groups. In the first clip, you assigned the students to the table groups while in the second and third clips, the students were allowed to decide for themselves who they wanted to work with. The usual classroom buzz related to partner work can be heard in the background'.

3.4.3 Data collection and measures

The SV-VR clips were watched individually, and after each clip participants completed a questionnaire with two questions:

1. Which three events caught your attention the most in this clip?
2. What do you think was going on in each of these three events? Multiple responses per event may be provided.

The answers to the first question were used to analyse participants' identification of events in a multicultural classroom and the answers to the second question were used to analyse their culture-specific interpretations.

3.4.5 Analysis

The answers to the first question on the questionnaire were analysed to find out which events participants identified (the first research question). Frequency analyses were performed per participant group (student teachers and expert teachers) and per SV-VR clip regarding the number of participants who mentioned a particular event. The events that were mentioned by 20% or more of each participant group are presented in Table 3.1. Differences and agreements between participant groups and clips were described qualitatively.

Content analysis was performed on the interpretations related to the identified events and on the comparison of this noticing component between the two participant groups. To structure the interpretations, categories were created based on the coding scheme developed by Wolff et al. (2015; 2017) using the 'Theme Code' referring to 'Learning & Discipline' (2015, p. 75). We split this combination code into a student learning category and a discipline category. The codes in the coding scheme of Wolff et al. (2015) referred to as

student attention (off-task and on-task) were categorized as 'student learning'. A relational category was also used based on the relational codes mentioned in Wolff et al. (2017, p. 301). Because the participants in our study were teachers themselves, no references were made to the relationship between the teacher and the students. The relational category that we could distinguish referred to student interactions. Table 3.1 presents the categories that we created to structure participants' interpretations. Interpretations mentioned by participants were described for each event, using the categories presented in Table 3.1

Table 3.1
Categories of interpretations.

Interpretations	Operationalization
Student interaction	Interpretations focusing on the mutual relationships and interactions between students, e.g., 'Dissatisfaction with the group', 'Showing off to each other'. Positive interactions such as 'Being friends'.
Student discipline	Interpretations focusing on non-compliance with rules, disrupting the lesson, being on social media when this is not allowed. e.g., 'The student is disrupting the lesson', 'The teacher does not intervene', 'The student is checking WhatsApp'.
Student learning	Interpretations focusing on students' motivation, attention/ engagement (off-task, on-task) and reactions to the teacher's instruction and intended learning goals, e.g., 'The student is doing his assignment', 'The student wants to work', 'The student is not motivated', 'The student is bored', 'They have finished the assignment'.
Other	Interpretations that cannot be categorized in one of the main three event types, such as references to a student's personal life, out-of-school events.

3.5 Results

3.5.1 Identifications

The events that were identified by at least 20% of the student teachers and expert teachers, are presented in Table 3.2. Three categories of identified events could be distinguished: (1) the scripted 'movement events'; (2) use of phones; (3) events related to engagement in the task. Furthermore, some stand-alone events

Table 3.2

Overview of the events per video clip that were identified by at least 20% of the 25 student-teachers (N/ %) and 10 expert teachers (N/ %).

STUDENT TEACHERS								
	Video clip							
1			2			3		
Event	*N*	%	Event	*N*	%	Event	*N*	%
A student threw a wad of paper.	22	88	Some students were on their phones.	16	64	A student was leaving the classroom.	22	88
A student at the back moved to a group at the front of the classroom.	18	72	A student retrieved a book/ dictionary from the teacher's desk.	16	64	Students from one group turned around and talked to another group.	13	52
Some students were on their phones.	15	60	One or more students had a bag on the table.	7	28	Some students were on their phones.	11	44
Several students had earbuds.	6	24	A student called out something to the student who grabbed the book (that he should grab one for him too).	6	24	A boy showed things on his phone/ Some students were looking at something on one phone.	7	28
			A student was lying with his head on the table.	6	24	One student was eating an apple.	7	28

EXPERT TEACHERS								
	Video clip							
1			2			3		
Event	*N*	%	Event	*N*	%	Event	*N*	%
A student threw a wad of paper.	10	100	Some students were on their phones.	6	60	Some students were on their phones.	7	70
A student at the back moved to a group at the front of the classroom.	6	60	A student retrieved a book/ dictionary from the teacher's desk.	4	40	A student was leaving the classroom.	5	50
One or more students were wearing caps.	6	60	Several students had earbuds.	2	20	One student was eating an apple.	5	50
Several students had earbuds.	5	50	Students were on task.	2	20	Students from one group turned around and talked to another group.	5	50
Some students were on their phones.	4	40	Some students were not collaborating.	2	20	Several students had earbuds.	3	30
Some students were wearing coats.	4	40	Some students were wearing coats.	2	20	Students were on task.	3	30
Students were on task.	2	20	A student called out something to the student who grabbed the book (that he should grab one for him too).	2	20	Some students were not collaborating.	3	30
Some students were off-task.	2	20				Some students were off-task.	2	20

could be distinguished such as 'A student eating an apple' or 'Students wearing coats'.

Few differences were identified between student teachers and expert teachers regarding which events caught their attention most. In both groups, the scripted 'movement' events were highly salient. In addition to these events, the use of phones was frequently referred to by both student teachers and expert teachers in all three SV-VR clips. Both groups identified that a boy was eating an apple in clip 3.

The student teacher and expert teacher groups did differ somewhat in what they identified. For example, expert teachers identified in all clips that several students were wearing earbuds. Some student teachers also identified this but to a lesser extent and only in clip 1. Expert teachers identified in clips 1 and 2 that some students were wearing coats, and in clip 1 they also identified that one or more students were wearing caps while student teachers did not. Conversely, student teachers identified in clip 2 that there were bags on the tables and that a boy was lying with his head on the table. These events were not mentioned by the expert teachers as one of the most relevant events.

The clearest difference between what student teachers and expert teachers identified as most relevant is that in all the clips some expert teachers referred to how the students were engaged in the task – off-task, on-task, not collaborating – while student teachers did not.

3.5.2 Interpretations

Most striking regarding the interpretations of identified events was that none of the participants, neither student teachers nor expert teachers, referred to cultural aspects at all. Although we put cues in the clips that could refer to differences in cultural background (e.g. the dictionary, students of different skin colour, headscarves), and we explicitly stated that the study was about education in a multicultural context and that they would see a multicultural classroom, neither participant group appeared to be triggered to interpret the events through a cultural lens. Other interpretations that the participants mentioned are presented below, structured by groups of identifications, and discussed with the categories mentioned in Table 3.1

Interpretations of the identified movement events

The most frequently identified event was the boy throwing a wad of paper. In both participant groups, interpretations for this event were related to student interaction and student learning. An example for a student interaction interpretation was: 'The boy wanted to attract attention from his classmates'. An example referring to students' learning was: 'He was not sufficiently challenged'. Expert teachers elaborated on this kind of interpretations, by, for example, mentioning that the assignment was not clear or that there was a lack of structure in the class. Both groups also referenced the students' uncertainty, such as, for example, 'The boy was not pleased with his work and wanted to throw it away immediately' and 'He was a failure-prone student'.

The event where the student at the back moved to a group at the front of the classroom was interpreted by both participant groups mainly as a student interaction event. These interpretations referred to disagreements between the boy and classmates in his table group, not wanting to join a particular group or a particular person or choosing a group where his friends were sitting. An occasional reference was also made to the student's learning process such as: 'He changed groups because the group he was in did not want to work on the assignment and he did'.

Interpretations of the event where the student retrieved a dictionary from the teacher's desk and another boy shouted at that boy, all referred to students' learning processes. Student teachers and expert teachers mentioned that the boys needed a dictionary because they did not understand a word that was used in the assignment.

The boy who left the classroom was mainly interpreted by both student teachers and expert teachers as going to the bathroom. In addition, an occasional interpretation related to students' learning was mentioned by expert teachers, such as 'The student found the assignment too vague', and 'He was not interested'. Student teachers mentioned a personal circumstance a few times such as 'the student feeling sick', or 'something was going on at home'. They also twice referred to student interactions: 'He went to his friend' or 'Students outside the classroom called him out to address him'.

Regarding the event where students from one group turned around and started to talk to students from another group, interpretations of both participant groups referred to students' learning or student interactions. Examples of student learning interpretations were: 'The students had finished the assignment', 'They lost their concentration', 'They were working on the assignment'. Examples of student interaction interpretations referred to the girls talking about the weekend, the girls being friends; the girls gossiping.

Interpretations of the identified phone use, wearing earbuds

The use of phones was mostly interpreted by both student teachers and expert teachers as related to student learning. For example: 'The students did not take the class seriously'. 'The students did not understand the assignment', 'The students had finished the assignment'. Both groups also mentioned personal circumstances referring to the student having contact with family or girlfriend. In addition, interpretations referring to student discipline were mentioned such as: 'The student was on social media', 'Checking Tinder or WhatsApp', and 'There were no clear rules regarding phone use'.

With respect to the earbuds, similar student learning and student discipline interpretations were provided as for the use of phones. However, one example of a student learning interpretation was different from the phone use examples and was mentioned by both participant groups: 'The students were working on the assignment, but they could work better with earbuds'.

Interpretations of identified on/off-task and collaborative behaviour

Only expert teachers identified this category of events. Interpretations of the events identified as off-task behaviour were related to students' learning and students' interaction. For example, student learning interpretations of off-task behaviour were: 'The assignment was not clear', 'Students did not know how to start', and 'They did not find the assignment interesting'. Examples of student interaction interpretations for off-task behaviour were: 'There was little group cohesion', and 'The students dared not say anything'. On-task behaviour was not interpreted any further.

Regarding the students not collaborating with each other, one interpretation was related to students' learning: 'The students were not interested in the topic of the assignment'. Other interpretations questioned why the students did not collaborate with each other: 'What are they discussing? I could not hear it', 'They got to choose who they wanted to work with but still they were not collaborating'.

Interpretations of other identified events

Eating an apple caught the attention of both student teachers and expert teachers. In both groups, interpretations were related to student learning, referring to disinterest in the topic. Other interpretations were explicitly student discipline-related such as: 'The student was breaking the class rules'. Expert teachers gave some less obvious interpretations, referring to personal circumstances such as: 'The student may have needed to eat for medical reasons, such as being diabetic'.

Student teachers identified bags on some tables and a student lying with his head on the table. Regarding the bags on the table, varied interpretations were given: student-learning-related interpretations such as 'He was not paying attention'; references to personal characteristics such as 'He was lazy'; student discipline interpretations such as 'The rules were not respected'; and interpretations referring to personal circumstances such as 'He packed his stuff because he had to go to the doctor'; 'His bag was wet'. Regarding the boy with his head on the table, mainly student-learning-related interpretations were mentioned such as: 'He had finished the assignment'; 'He was bored'. Two other interpretations were also given, related to personal circumstances: 'He was tired'; 'Something happened that stressed him out'.

Expert teachers identified students wearing caps and students wearing coats. Wearing caps was interpreted as a student discipline event because the students were breaking rules. Wearing coats was also interpreted as a student discipline event but it was also mentioned that the boys may have been cold or just wanted to act tough.

3.6 Discussion and conclusions

3.6.1 Discussion

With this study we focused on student teachers' and expert teachers' noticing in a multicultural classroom context. Therefore, we examined and compared student teachers' and expert teachers' identification and interpretation of events in a multicultural classroom and what culture-specific interpretations they give to these events.

Participants' identifications of events in a multicultural classroom context

The results from this study contradict previous research which found that expert teachers recognize and reference typical events significantly more than novice teachers and identify relevant details that novice teachers often do not see (Chi, 2006; Wolff et al., 2015; 2017). No differences were found between student teachers and expert teachers regarding the identification of typical events or the identification of details in this study. The most identified events in both groups were students' use of cell phones and the scripted events involving student movements.

Another divergence from previous research (Stahnke and Blömeke, 2021; Stürmer et al., 2017) was that no differences were found between student teachers and expert teachers with respect to attention dispersion across students. Both groups of participants focused mainly on the same events and therefore on the same students.

It is remarkable that in addition to the points outlined above, expert teachers mentioned some events that already had a learning-related interpretation in them while student teachers did not. These events referred to on/off-task behaviour and students cooperating or not cooperating. Expert teachers seemed to deploy their professional knowledge, immediately tapping into a deeper layer of identification that is already an interpretation.

Participants' interpretations of events in a multicultural classroom context

Participants in both groups did not explicitly interpret the identified events through a cultural lens and, in contrast to previous research findings (Wolff et al., 2015; 2017), they interpreted the events in terms of similar themes. Whereas expert teachers in the studies of Wolff et al. (2015; 2017) mainly interpreted classroom events as student learning and novice teachers as student discipline, both groups of participants in our study mainly interpreted the identified events as related to student learning or student interaction.

Neither the student teachers nor the expert teachers made any references to culture. This did not align with our expectations. We expected that expert teachers would have built scripts (Wolff et al., 2016; 2021) for the multicultural classroom through knowledge of and experience in that specific context, and thus would interpret events through a cultural lens.

Not mentioning culture-specific interpretations does not necessarily mean that participants were not looking at events through a cultural lens and did not have scripts for that specific context. Possibly they did but kept these interpretations implicit. For example, regarding the event where the boy at the back moved to a group at the front of the classroom, several participants mentioned that the boy did not want to work with a particular student or group or that he was excluded by his assigned group. The reason why these participants thought he did not want to cooperate with the students in his table group or why he would be excluded was not mentioned. It remains unclear whether these participants were implicitly looking at these events through a cultural lens.

Denying culture-related interpretations or keeping culture-related interpretations implicit could have to do with fear of stereotyping or not considering culture the most important characteristic to mention. It could also be that the participants in this study had a culture-blind attitude toward teaching diverse learners (Cochran-Smith, 1995; Hachfeld et al., 2011, 2015; Hahn et al., 2010; Milner, 2006) and thus did not consider it relevant to bring differences between students into their interpretations of classroom events. A culture-blind attitude emphasizes that all students are alike and should be treated the same way, irrespective of their cultural background. However, this attitude does not take

into account that not all students have the same starting position in their school career (Cochran-Smith, 1995; Hachfeld et al., 2011, 2015; Hahn et al., 2010; Milner, 2006). A prerequisite for culturally responsive teaching is a multicultural attitude (Cochran-Smith, 1995; Hachfeld et al., 2011, 2015; Hahn et al., 2010; Milner, 2006), which stresses the importance of acknowledging and considering students' cultural differences and using student diversity to give all students the opportunity to reach their full potential.

3.7 Limitations and directions for further research

Although this exploratory study provided initial insights into how student teachers and expert teachers notice in a multicultural context, the results should be interpreted with some caution. Because of the method used, it is difficult to compare participants' interpretations with previous research. Watching from a first-person perspective with an HMD where the whole class can be viewed may give a different perception of classroom events than if participants were watching a class with the teacher at work, watching a real class or their own class. In addition, the SV-VR clips were recorded at a specific moment in class when the students were expected to work in small groups. Participants may have identified and interpreted other types of events during different activities, such as when listening to the teacher's instructions, during transitions in the lesson or when working independently.

To improve understanding of teachers' noticing through a cultural lens in a multicultural classroom, future research could compare participants' noticing of similar classroom events in a more culturally homogeneous with a multicultural classroom. It would also be interesting to see if differences could be discerned between what participants notice in different classroom situations within a multicultural class (e.g. during instruction, at the beginning of class, when working on an assignment, during a transition) and with different methods used (e.g. watching a video where the teacher is working, watching from a first person perspective, watching their own class).

3.7.1 Practical implications

The SV-VR clips developed for this study could be used in teacher education programs to prepare student teachers to teach in a multicultural classroom. In the Netherlands, not all student teachers gain experiences in this specific classroom context and these SV-VR clips watched with an HMD could offer immersive experiences within a nearly authentic multicultural classroom. The advantage of this method is that it can offer student teachers experiences in a safe setting under the guidance of a teacher educator. Student teachers can make mistakes without harming students and learn about the multicultural context step by step.

An important aspect of learning to teach in a multicultural classroom context is being able to notice through a cultural lens. The clips could help with this, but it would be desirable to incorporate scaffolds. For example, an incremental level of difficulty could be integrated into different clips such as reducing the explicitness of the cues that refer to culture-related events. Explicit cues, for example, could be emphasizing students' verbal expressions. Then, as the school year progresses, SV-VR clips could be shown with less explicit cues, which requires more cultural sensitivity on the part of the student teacher.

The SV-VR clips could also be used to support student teachers to reflect on their underlying attitudes regarding multiculturalism, both inside and outside the classroom. Getting students with different attitudes towards diversity to discuss what they saw in the clips and how they interpreted it could reveal students' attitudes towards diversity. This could also expose possible biases to which peers or teacher educators could critically respond.

3.7.2 Concluding remarks

In the current study neither the student teachers nor the expert teachers expressed culture-specific interpretations of events in a multicultural classroom. Although the research method with SV-VR clips creates a nearly authentic and immersive environment, it seems that more cues are required to ascertain whether and how student and expert teachers notice through a cultural lens. The results from this study provide a basis for further research on this topic.