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The effects of using students' funds of knowledge on educational outcomes in the social and personal domain

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ABSTRACT

Knowledge that students acquire outside school may not be recognized in school when teachers have different social-cultural backgrounds than their students. The theory of funds of knowledge/identity (FoK/I) makes a plea for teaching that draws on students' knowledge, skills and experiences. We investigated how using students' FoK/I affected their personal and social functioning and the social cohesion in the classroom, using a mixed-method quasi-experimental design. Thirteen teachers applied several ways of drawing on their students' FoK/I; eight teachers and their students participated as a control group. Student questionnaire data were collected (N = 299; pre-post control group) and students from the intervention group were interviewed (N = 67). Teachers from the intervention group completed logbooks and were interviewed individually twice during the intervention, and in a focus group setting after the intervention. The quantitative data did not show significant effects. However, teachers and students reported effects on students' engagement, learning behavior, learning attitudes, collaboration skills, self-confidence, general well-being in the classroom, ambitions and perspective taking. Also positive effects on the climate in the classroom were reported: students getting to know each other better, increased respect among students, improved interactions, increased involvement in learning, and a more positive atmosphere in the classroom.

1. Introduction

Discontinuities between school and home can make children perform below their abilities. Most theories about these discontinuities emphasize students' shortcomings. The theory of funds of knowledge/identity (FoK/I), however, focuses on students' competences (Esteban-Guitart & Moll, 2014; Moll, Amanti, Neff, & González, 1992). It makes a plea for building on the skills and knowledge that students acquire in their families, communities, peer groups and through social media and that may not be recognized by teachers, when these are from different social-cultural backgrounds than their students. Several positive outcomes of drawing on students' FoK/I are mentioned in the literature. It is argued that it enhances students' school engagement (González, Moll, & Amanti, 2005; Llopart & Esteban-Guitart, 2017) and helps them connect with new learning content and thus supports academic learning (Subero, Vujasinović, & Esteban-Guitart, 2017). An improved student-teacher relationship is also mentioned (Barton & Tan, 2009; Irvine, 2003; McIntyre, Rosebery, & González, 2001). Some authors focus on non-academic outcomes, such as empowerment of students (Ordóñez, Siques, & Esteban-Guitart, 2018; Poole, 2017; Subero et al., 2017) and enhancing student agency (Charteris, Quinn, Parkes, Fletcher, & Reyes, 2016). However, the positive effects in the social and personal domain in particular are usually

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vaguely defined and few studies have actually measured effects of using students' FoK/I. In order to address these gaps, we conducted a mixed-method experimental study, in which we investigated the effects of drawing on students' FoK/I on their personal and social functioning and on social cohesion in the classroom.

1.1. Funds of knowledge and funds of identity

In the Netherlands, as in other countries, many students experience a gap between the knowledge they learn at home and in school (Banks, 1993; Cockrell, Placier, Cockrell, & Middleton, 1999). Teachers, on the other hand, who have a different cultural and social background than their students, do not always recognize the knowledge and skills that students have already acquired. This discontinuity between school and home can mean that, in particular children with an ethnic minority or lower social economical background, lose their interest in school and perform below their abilities (Bronkhorst & Akkerman, 2016; Lee, 2001).

While many theories about discontinuity between home and school emphasize students' shortcomings, the theory of funds of knowledge focuses on students' competences, and the skills and knowledge they acquire outside of school. Funds of knowledge theory argues that teachers can decrease the gap between school and home by drawing on the knowledge and skills that students acquire in their families and communities and can thus support academic learning (González et al., 2005; Hogg, 2011). Home visits are commonly used to acquire insight into students' FoK (e.g. Tenery, 2005). It has been described how such visits may improve family-school relationships, as they enable teachers to understand students and their families from historical and cultural perspectives, and to create a more inclusive learning environment (Lin & Bates, 2010; Llopert & Esteban-Guitart, 2018; Llopert, Serra, & Esteban-Guitart, 2018; Meyer & Mann, 2006). However, complexities that teachers may face when they intend to adopt an asset-based approach to students and their families have also come to the fore (Whyte & Karabon, 2016).

Recently, scholars have pointed out that the knowledge students acquire outside school encompasses more than what they learn in the family and community, and what may be uncovered through home visits. Moje et al. (2004) proposed to also focus on knowledge and skills that students acquire in their peer groups and from popular culture. Nowadays social media and the internet seem important learning contexts. Esteban-Guitart and Moll (2014) suggested the concept of funds of identity, that focuses on funds of knowledge that are meaningful for students, as family and community FoK are not necessarily related to students' interests and experiences. In this study we speak of 'funds of knowledge and identity' (FoK/I), as we think the term 'knowledge' expresses the value of students' funds for school learning, whereas the term 'identity' emphasizes that it is only useful to draw on knowledge that is meaningful for the student.

FoI scholarship provides us with descriptions of an extensive repertoire of methods for learning about students' knowledge and experiences that look beyond the family context (e.g., Marsh & Zhulamanova, 2017; Saubich & Esteban-Guitart, 2011). It thus also addresses another problem of the FoK approach, namely the fact that home visits are sometimes difficult to conduct and time-consuming for teachers. The FoI literature suggests methods that can be applied by teachers in school settings, including students making videos, photographs and self-portraits, writing diaries and bilingual texts, and filling shoeboxes with significant items and bringing these into the classroom (Hogg & Volman, 2020; Subero et al., 2017).

The FoK and FoI literature also provides suggestions for how teachers can build upon students' knowledge, skills and interests in their lessons to promote and support learning (Llopert & Esteban-Guitart, 2017). Ways to pedagogically apply students' FoI include designing teaching units that are related to specific students' FoI (e.g. Saubich & Esteban-Guitart, 2011) or lessons that build on shared FoI held by a group of students (e.g. Ordóñez et al., 2018). There is a strong link with the literature on contextualizing learning (Silseth & Erstad, 2018), as building on students' FoI entails contextualizing curricular content by linking it students' lives and experiences outside the school (Llopert & Esteban-Guitart, 2017).

1.2. Educational outcomes in the personal and social domain

Over the past few years, Biesta's (2010, 2015) argument that education is not only about qualification, but always also functions in relation to two other domains of purpose - socialization and subjectification - has gained great popularity. Drawing on students' FoK/I was initially mainly related to the domains of qualification. It was argued that it yields academic outcomes and improves students' learning (Lee, 2001; Subero et al., 2017). Also conditions for learning were mentioned that can be improved by acknowledging and building on students' FoK/I: engagement with learning (González et al., 2005; Llopert & Esteban-Guitart, 2017), and an improved student-teacher relationship (Barton & Tan, 2009; Irvine, 2003; McIntyre et al., 2001). More recently, however, the value of using FoK/I is also promoted with arguments that are related to the domain of purpose that Biesta calls 'subjectification', which refers to "the way in which children and young people come to exist as subjects of initiative and responsibility rather than as objects of the actions of others" (Biesta, 2015, p.77). Poole (2017), Subero, Llopert, Siques, and Esteban-Guitart (2018) and Ordóñez et al. (2018) see empowerment of students as an important purpose of using their FoI and Charteris et al. (2016) discussed how it may enhance students' agency.

Least common in pleas for drawing on students' FoK/I are arguments related to socialization: initiating students in traditions and ways of being and doing (cultural, professional, political, religious) that we want them to become part of (Biesta, 2015, p.77). Rather, using FoK/I is seen as a way to acknowledge traditions and ways of being and doing, that students are already familiar with and part of, but that are not recognized or valued at school. Nevertheless, ways of being and doing are imaginable that teachers would want to introduce students to, that are promoted by the FoK/I approach. In many Western societies a renewed interest in the socialization function of education has occurred in the past decades, as a response to increased ethnic and cultural diversity, growing individualization and concerns about a presumed erosion of social cohesion. This was accompanied by a growing interest in educational

research into aims and outcomes in the social domain (OECD, 2007). Such 'social outcomes' on the one hand concern knowledge, skills and attitudes that individual students need in interpersonal interactions and in society at large (Ten Dam & Volman, 2007). On the other hand the term refers to outcomes of education at a collective level, such as social cohesion (Dijkstra & De la Motte, 2014).

As to the individual level, Ten Dam and Volman (2007), based on a literature review, distinguish an intrapersonal, an interpersonal and a societal dimension of social competence. The intrapersonal dimension includes for example self-confidence, self-respect and self-knowledge, outcomes that can easily be related to purposes of using FoK/I mentioned in the literature. The interpersonal dimension among others includes social values, social cognition, and communicative skills. The societal dimension refers to, for example, a democratic attitude, and being able to deal with (cultural) differences. Again these are outcomes that working with students' FoK/I might contribute to.

At the collective level, social cohesion in the classroom is an upcoming research domain. Social cohesion in the classroom is an ambiguous concept, that may refer to a sense of belonging (Healy, 2019), mutual trust (Dinesen, 2011) or mutual tolerance (Hughes, 2014). Recently a definition in terms of strong social networks in the classroom has gained popularity, along with the fast development of network analysis techniques (e.g. Munniksma, Stark, Verkuyten, Flache, & Veenstra, 2013; Stark, 2011). A positive effect of paying attention to students' funds of knowledge on social cohesion in the classroom is not often suggested in the literature, but seems obvious: students get to know each other better and may gain a better understanding of each other's experiences.

1.3. The present study

Research into the use of FoK/I for school learning is mainly based on theoretical analysis or qualitative case studies (see reviews by Llopert et al., 2018, and Hogg & Volman, 2020). Few studies have investigated actual impacts for teachers and students. In a previous paper we described how teachers used several ways of finding and drawing on students' FoK/I ('t Gilde & Volman, submitted). However, we were also interested in the effects of using students' FoK/I. In this article we particularly focus on effects in the social domain. Our research question was: *What are the effects of using students' FoK/I on their personal and social functioning and on social cohesion in the classroom?*

We focused on a number of social outcome variables for which valid and reliable scales were available: 1) students' well-being in the classroom in terms of relationships with the teacher and classmates, and 2) students' attitude and skills concerning dealing with differences. We were also interested in whether working with students' FoK/I would affect students' personal development. As this outcome is intended to differ per student, we used a scale that does not measure actual outcomes but the extent to which students experience a focus on personal development in the classroom. Finally we wanted to measure effects on the social network in the classroom. We hypothesized positive effects of using students' FoK/I on:

1. Students' well-being in the classroom
2. Students' attitudes and skills concerning dealing with differences
3. Perceived focus of the school on personal development
4. Social cohesion (in terms of the social network) in the classroom

As we expected a broader variety of social outcomes in the social domain than can be measured with the scales we employed, and as we also aimed at a more in-depth understanding of the effects of using students' FoK/I and mechanisms underlying these effects, we also approached our research question in a more open way through interviews.

2. Methodology

2.1. Research design

This research used a mixed methods pretest-posttest control-group design. In the course of a school year thirteen teachers applied several ways of finding and building on the FoK/I of their students (intervention group). Eight teachers and their students who did not work with students' FoK/I were also involved. In order to establish effects of drawing on students' FoK/I, student data were collected with a questionnaire. In order to find additional effects and get more in-depth insight in the effects measured by the questionnaire, and the mechanisms underlying these effects, student and teacher interviews were conducted. Group interviews were conducted among the students in the intervention group at the end of the intervention. The teachers in the intervention group were interviewed individually twice, once half way the intervention and once at the end, and the intervention was evaluated in two focus group interviews, for which the teachers were divided in two groups. Teachers also reported on their activities in a pre-structured logbook two to four times while carrying out the intervention.

2.2. Participants

Thirteen primary school teachers from eight different primary schools in Amsterdam, the Netherlands, participated in the intervention with their students. The questionnaire was also filled in by a control group, consisting of students from eight classes from four schools that did not participate in the intervention. The schools were situated in different areas of Amsterdam with varying populations, which also caused the student populations to vary.

Table 1 gives an overview of the participants.

From the thirteen *teachers* who actively participated in the intervention, eight teachers were working with students aged nine to twelve years old and five with students aged four to nine. Twelve teachers were female and one male. Two teachers shared a class and therefore were interviewed together.

Although the teachers taught children aged four to twelve years, only *students* from grades 4, 5 and 6 (aged 9–13) were asked to fill in the questionnaire, because of the required reading, comprehension and reflection skills. As [Table 1](#) shows, the questionnaire was filled in by students (N = 144) from six classes (five schools) that participated in the intervention and students (N = 155) from eight classes (four schools) that formed the control group.

Group interviews were conducted with students (N = 67) from the classes in the intervention group, except for the students from Kindergarten (age 4–6 years old). In pilot interviews it proved difficult for these young children to reflect on the activities of their teachers as they could not remember these. The interviews were conducted in groups of two to six students.

All teachers and students participated in the research voluntary. Informed consent was obtained from teachers, students and their parents. Teachers and the parents of students who were interviewed signed a consent form. As the questionnaire did not ask for personal data, parents of the other students were only invited to object if they did not want their child to fill in a questionnaire. The study was approved by the ethics committee of the Faculty of Social and Behavioral Sciences of the University of Amsterdam.

2.3. Intervention: finding and building on FoK/I

The intervention took place between September 2018 and June 2019. Five meetings were held with the participating teachers, each lasting one and a half hour. In the first meeting the teachers were introduced to FoK and FoI theory and research. In the second meeting examples of good practice of finding and using FoK/I gathered by the teachers were discussed and related to theory. After this meeting teachers made plans of action for how they were going to apply the FoK/I approach in their own classrooms, and these were discussed in the third meeting. In the fourth meeting the teachers exchanged their experiences in carrying out their plans of action. The fifth meeting was set up as a group interview aimed at evaluating the project and its results. For examples of the activities teachers carried out in their classrooms we refer to ['t Gilde and Volman \(submitted\)](#).

Table 1
Participants.

School (Intervention group)	Student population	N teachers participating in intervention and interviews	Age (grade) of students (grade)	N students questionnaire/ interviews
1 S-school	Multicultural Low SES	3	8–9 (grade 3) 9–10 (grade 4/5) 10–11 (grade 6)	–/3 + 3 24/6 30/4
2 B-school	Multicultural, Low SES	1	8–9 (grade 3)	–/3 + 3
3 Ac-school	Homogenous High SES	1	10–11 (grade 5)	28/5
4 W-school	Multicultural High and low SES	2	4–6 (KG)	–/–
5 Ar-school	Multicultural Middle SES	2	9–10 (grade 4) 4–6 (KG)	20/5 + 3 + 3 –/–
6 Re-school	Multicultural Low SES	1	11–12 (grade 6) 6–9 (grade 1,2,3)	23/4 + 2 + 2 –/5
7 Si-school	Multicultural High and low SES	2	7–8 (grade 2)	–/3 + 3
8 Ro-school	Multicultural Low SES	1	10–11 (grade 5)	19/4 + 3
Total				144/67
School (Control group)	Student population	N groups	Age (grade) of students	N students questionnaire
9 H-school	Multicultural Low SES	1	10–11 (grade 6)	19
10 R-school	Multicultural Low SES	2	9–10 (grade 4) 10–11 (grade 5)	27 21
11 I-school	Multicultural Low SES	4	9–10 (grade 4) 10–11 (grade 5) 11–12 (grade 6)	9 9 9 & 7
12 Ws-school	Homogenous High SES	1	9–10 (grade 4) 11–12 (grade 6)	27 27
Total		8		155

2.4. Variables and instruments

2.4.1. Quantitative measures

A student questionnaire was used for measuring a number of social outcomes for which valid and reliable scales were available.

For measuring *social well-being in the classroom* we used two scales previously used in the cohort study COOL 5-18 (Driessen, Mulder, Ledoux, Roeleveld, & van der Veen, 2009). The two scales concern the relationship of the student with 1) the teacher (7 items; Cronbach's alpha 0.86) and 2) fellow classmates (6 items; Cronbach's alpha 0.68). Example items are: 'I can talk with my teacher about problems' or 'Sometimes I feel lonely in the classroom'. Students are asked to score these items on a five-point scale (ranging from 'entirely not right' to 'entirely right').

Attitudes towards and skills in *dealing with differences* were measured by using two scales from the Citizenship Competences Questionnaire (CCQ; ten Dam, Geijssels, Reumerman, & Ledoux, 2010). The attitude scale consists of 6 items (Cronbach's alpha 0.74) and employs a four-point scale (ranging from 'does not match me at all' to 'matches me very well'); an example item is 'I like learning about the lives of other people'. The skills scale also has 6 items (Cronbach's alpha 0.74) and a four-point scale ('not good at all' to 'very good'); an example item is 'how good are you in adapting to someone else's rules and habits'.

For measuring the students' perception of the *focus on personal development in the classroom* we used a scale developed by Karssen and Heemskerk (2018). The scale is composed of nine items (Cronbach's alpha 0.77), for example 'In this classroom you learn to discover what kind of person you are'. The items are rated on a five-point scale (ranging from 'completely disagree' to 'completely agree').

Finally, we wanted to measure whether there would be significant changes in the *social network in the classroom*, i.e. student's relationships with each other. We used a question from the questionnaire of the Interuniversity Center for Social Science Theory and Methodology (ICS) (Stark, 2011) in order to map students' network. Students were asked how nice they found each fellow classmate and to score this on a five-point scale (ranging from 'not nice at all' to 'very nice').

2.4.2. Qualitative measures

In the semi-structured teacher interviews teachers were asked to reflect on the effects of using students' FoK/I they perceived and the mechanism they thought were underlying these. The teachers' action plans and logbooks were used as input for the interviews. In discussing the effects the teachers perceived, we distinguished between effects at different levels: individual students, the group of students and the teachers themselves. Students were asked to describe the activity which they had done with their teacher in relation to their funds of knowledge, and they were asked how they had experienced it.

2.5. Data analysis

We applied a multilevel analysis with random intercepts for subjects modelling differential growth between the experimental and control conditions on the scales of the questionnaire that represented different social outcomes. To analyze the networks we first calculated a total score for all dyads (pairs of students) per class, then we subtracted the total score of the post-test from the pre-test. A positive result from this subtraction signifies an increase in how nice students in a class find each other on average, a negative result a decrease.

The interviews with teachers and students, focus groups and teacher logbooks were analyzed using content analysis (Miles & Huberman, 1994). Atlas.ti 8 software was used to code and systematically summarize the data. The coding was carried out in three stages. First, the data was coded, using 1) effects for individual students and 2) effects at the group level, as a priori codes. During this coding process it appeared that teachers often commented on the effects of working with FoK/I on 3) themselves, and 4) their relationship with parents. Therefore we included these as additional codes (see Table 2). Secondly, we worked inductively, refining these codes into subcodes for each effect mentioned by a teacher or student. Subcodes were added every time a new effect was mentioned. Finally a summary was written for each effect c.q. subcode. The second author performed the initial coding, but every decision (concerning adding, refining or renaming a code) was discussed among the authors, and so were any doubts about how to interpret a teacher's or student's words. Our focus was on the richness of effects and examples, rather than on the quantity of quotations associated with each category. Moreover, quantifying proved difficult as the data were of different kinds (interviews, focus groups and logbooks) and because teachers sometimes mentioned the same effect several times in their interview, when elaborating on it with examples.

Table 2
Content of the codes.

Category	Content
Individual effects students	References to effects of using FoK/I on students
Group effects students	References to effects of using FoK/I at the level of the group/class
Additional effects (on teachers themselves)	References to effects of working with students' FoK/I on the teachers themselves
Additional effects (on relationship with parents)	References to effects of working with students' FoK/I on the teacher's relationship with parents.

3. Findings

3.1. Effects on students' social and personal functioning

The questionnaire measured five variables related to the social and personal functioning of individual students: (1) social well-being as the relationship of the student with the teacher, (2) social well-being as the relationship of the student with other students, (3) attitude towards dealing with differences, (4) skills in dealing with differences, and (5) experienced focus on personal development. Table 3 presents the means and standard deviations on all variables by group and measurement occasion.

However, the analysis of the questionnaires showed no significant effect on any of these variables as can be seen in Table 4. So our hypothesis about the positive effects of using students' FoK/I on these variables had to be rejected.

3.2. Effects on students' social and personal functioning (teacher perspective)

Although the analysis of the questionnaires did not reveal any significant effects of working with students' FoK/I on individual students, in the teacher interviews many positive effects in the personal and social domain were mentioned. Obviously, students acquired new *knowledge and skills* through what other students taught them and through the FoK/I-based lessons and projects that teachers developed. Teachers, however, also pointed out effects on students' 1) engagement, 2) learning behavior, 3) learning attitudes, 4) collaboration skills, 5) self-confidence, 6) general well-being in the classroom, 7) ambitions and 8) perspective taking. Below we discuss each of these perceived effects and the mechanisms that may explain them.

Several teachers explained how FoK/I-related activities motivated students and increased their *engagement* in school work. They noticed that students were willing to work longer and practice more in the FoK/I-related activities than in regular lessons. In one of the classes, many students knew how to cook, as they were used to cooking for their brothers and sisters at home. The teachers organized a dinner show, where all students would bring some food. This inspired one of the students to continue cooking and try out a recipe with his grandmother of special Antillean peanut cookies during the weekend, which he then brought to school. Students' enthusiasm seemed to have a viral effect on other students. Teachers commented that the more students became owners of a project or activity, the higher their engagement.

The appeal on their FoK/I also had an impact on students' *learning behavior*; they were challenged to take initiatives and responsibility, and act more independently. For instance, one of the teachers prepared an exposition on WWII with her class. After visiting the resistance museum, a shy student came to school with materials from WWII from her grandfather and engaged in a discussion, first with the teacher and later with the entire class, telling the story of her grandfather during WWII. Later on she presented these materials to the visitors of the exposition. In addition, a group of students initiated the organization of a quiz on WWII for parents. Kindergarten children who were making their own traffic square, took over the lead of the process from the teacher. They carefully followed the list of activities they had made with the teacher and would come and tell the teacher what they wanted to do next and what they needed to finish the square. According to the teachers, a mechanism contributing to this self-directed learning behavior was the students' experience that the teacher trusted them.

Teachers also observed how building on students' FoK/I contributed to new and improved *attitudes towards learning*. Firstly, teaching other students required quite some courage for some students. One teacher let her students teach their fellow students about their talent or passion. Some of them found it scary, but they learned they could do it, and also learned about dealing with challenges. Secondly, students' FoK/I were a good starting point to let students experience the value of certain attitudes towards work and learning. For example, a group of students decided they wanted to develop their own three dimensional game. The teacher guided them through the process and made them experience that quality of work requires patience, time and reflection. The students in turn were prepared to invest these qualities in their project, as it was really theirs. Another teacher started a challenge about holding up the ball with your foot. She first told students she was embarrassed to admit that she could not hold up for more than once. With help of her students she managed to build it up to five times. Other students participated in the challenge and practiced until they broke their own

Table 3

Means and standard deviations by group and measurement occasion.

	Intervention group						Control group					
	Pretest			Posttest			Pretest			Posttest		
	N	M	SD	N	M	SD	N	M	SD	n	M	SD
Relationship with teacher ^a	139	25.62	(6.21)	132	25.48	(6.33)	142	25.65	(5.93)	136	24.38	(6.63)
Relationship with classmates ^b	128	23.76	(4.41)	132	23.09	(4.55)	139	24.16	(4.03)	132	24.39	(4.05)
Attitude dealing with differences ^c	137	17.12	(3.69)	132	17.61	(3.84)	145	18.28	(3.18)	134	18.44	(3.24)
Skills in dealing with differences ^d	140	18.52	(3.08)	136	18.18	(3.25)	149	18.83	(3.07)	139	18.74	(3.37)
Experienced focus on personal development ^e	137	35.72	(5.45)	133	34.83	(5.86)	145	35.54	(4.99)	139	34.22	(5.6)

^a Min 7–max 35.

^b Min 9–max 30.

^c Min 6–max 24.

^d Min 6–max 24.

^e Min 15–max 45.

Table 4
Multilevel models of the five dependent variables (intervention group versus control group).

	Relationship with teacher			Relationship with classmates			Attitude dealing with differences			Skills in dealing with differences			Experienced focus on personal development		
	est.	SE	p-Value	est.	SE	p-Value	est.	SE	p-Value	est.	SE	p-Value	est.	SE	p-Value
Fixed effects															
Interrelation	1.19	0.68	0.08	-0.82	0.5	0.11	0.2	0.39	0.6	-0.11	0.35	0.75	0.44	0.71	0.54
Random effects															
Variance t1	27.94	2.43	x	16.5	1.45	x	10.33	0.89	x	8.45	0.71	x	27.26	2.31	x
Covariance t1, t2	13.84	2.07	x	8.55	1.2	x	5.88	0.76	x	5.09	0.63	x	13.25	2.05	x
Variance t2	30.71	2.79	x	16.42	1.5	x	11.04	0.98	x	9.89	0.86	x	32.8	2.82	x

record. Thus they learned about the value of practicing. The teacher, besides working on these attitudinal goals, also used the challenge for mathematics lessons.

When drawing on students' FoK/I, teachers often used collaborative methods, which had a positive effect on students' *collaboration skills*. They described how the FoK/I-related activities taught students skills such as listening to and showing interest in each other and each other's ideas. This also included taking responsibility for tasks and assignments and taking up different group roles. One teacher let students from grade one, two and three create their own island in groups. All students brought in their ideas about what was important to have on the island and listened to each other's ideas. In the higher grades, students were given responsibility for developing a workshop or executing a task together, which presented an opportunity for teachers to point out how important different roles are in group work. For example, in a grade four, the class decided to make a movie. Students themselves came up with a division of roles: actors, director, stage manager, etc. However, at some point, the movie director was discouraged and wanted to give up. During a group discussion, the class searched for a solution, as they realized they needed the director for finishing the movie. In three other classes (grade 5 and 6) students created dances for the end of the year musical and for a workshop; they took care that the dances were suitable and enjoyable for their fellow classmates and were ready on time.

According to the teachers, using FoK/I in their classroom positively affected some students' *self-confidence* as learners. The mechanism underlying this effect was the students' feeling that their skills and knowledge were valued. Students were often proud to show and share their knowledge and skills to their classmates. And when students showed expertise by talking about a specific subject, teaching a sport or language, or showing their talents in another way, this usually invoked admiration and respect in their fellow students, which in turn made students think positively about themselves. Several teachers gave examples of students who performed below average in the core subjects, but gained confidence and started to feel more competent, when their interests, talents or specific knowledge and skills were valued and built upon in the classroom. For instance, one student was described by her teacher as having low self-confidence and not performing well on the school subjects. However, during an activity around rap and Martin Luther King, the teacher discovered that she could write amazing poems. Other students admired her work and she became the expert poet of the class. Another student, encouraged by her teacher and fellow students, developed her dancing skills and was accepted to a dance academy.

Teachers also observed that working with FoK/I in their lessons positively affected *students' well-being* more generally. One underlying mechanism seemed to be that revealing and building on students' FoK/I often invited students to share personal information, which made other students know them better and in turn made the students feel known. For example, one teacher created 'emotion bags' with her students; bags in which children can put something that can help them feel better in class, such as a teddy bear or a nice pen. Marc told the teacher he wanted to put a personal story in his bag. Together with his father he wrote a story about his mother who had died and how they had up and downs in rebuilding their life together. The teacher read the story to all children, which helped the boy feel that he could share his story and that other children cared for him. Some children gave a presentation about issues they struggled with such as high sensitivity or nervousness, allowing them to show their classmates new aspects of themselves. Teachers reported that sharing personal stories seemed to make students happier and freer in the classroom. Another teacher used rap to help one boy express his feelings about his stepfather's sudden death. Another teacher created trust between her and her students by telling her personal story about her challenging emigration to the Netherlands as a child. This led to children also sharing personal stories.

Positive experiences in FoK/I-related activities also affected students' *ambitions*. One of the teachers explained how positive experiences helped some students regaining confidence in their ability to perform well on school assignments. Teachers also mentioned an increased understanding of the relationship between effort and performance. In his class the test results of several students' even significantly improved, compared to their results in the previous year, which the teacher attributed to his focus on their talent and their positive experiences in the FoK/I-related learning activities.

Finally, some teachers felt that working with students' FoK/I helped students develop *new perspectives*. It contributed to developing an open mind and expanded their understanding of the world and their relation to it. Listening to each other's stories and experiences, students were sometimes confronted with things they initially found strange. During a discussion about the waste of food, it appeared that most students did not know what 'wentelteeftjes' (French toast) are. The teacher allowed two students to explain the recipe and cook them for the others. Several students did not find the idea of old bread drenched in milk and egg very appealing, but actually liked the 'wentelteeftjes' when they tried.

3.3. Effects on students' social and personal functioning (student perspective)

Students confirmed the effect on *engagement* by telling how enjoyable and motivating they found the FoK/I-related activities. Both the personal connection with a topic and the freedom to choose contributed to their enthusiasm and motivation. For instance, during a project about the Dutch provinces, children were allowed to choose the province they wanted to explore and to represent the knowledge they acquired in their own way. One girl narrated how she was not motivated by the topic at all, as she already knew much about the provinces, until she heard that they could also choose the province of Frisia:

"My grandpa and grandma live there and I like the province very much. [...], it is cozy there."

Students also mention a mechanism that did not explicitly occur in the teacher interviews. In many cases the FoK/I-related activities were different from the regular classes, and did not really feel like work to them. This was the case, for instance, in the class where students taught the teacher how to keep the ball up with your foot, As one of the students commented:

"It makes you want to come to school, because we do nice things with the teacher."

In terms of *learning behavior*, the student interviews showed that the responsibility they were allowed was an important factor.

Students mentioned that they liked being given a responsible a role. One student who developed a workshop for younger children said:

“It was rather fun, because you could come up with things and teach them to someone else, a little bit as if you were a teacher. It was quite different from usual, because I was what I am never allowed to be.”

Another student who taught his teacher how to use a bow and arrow said:

“A teacher normally explains to children how to do things. This time it was different”.

Students also recognized what they learned in terms of *learning attitudes*. The students who coached their teacher and fellow students in holding up the ball, explained the value of perseverance. They narrate how a boy wanted to reach twenty times, but did not manage to do so:

Student 1: “We told him: “You have to continue, just practice, again practice, and then you will be able to do it more than twenty times.”

Student 2: “And then he managed to do it 35 times! That felt good. That you just taught someone something.”

Student 1: “That he has to persevere, [...] that you should never give up.”

In a similar way, two girls who made a dance for the end of the year musical explain how they learned about persevering:

“I learned to persevere. [...] First I thought: ‘This is not going to work’. And then we really worked and now something good came from it. [It feels] really very good.”

Students also illustrate what working on FoK/I-related activities taught them about *collaboration*. One student tells how he felt very responsible for the article he and a classmate had to write about sustainability. However, his classmate was less motivated and organized, which taught him about the challenges of group work.

In the previous section teachers mentioned the effect of working with students' FoK/I on their *self-confidence*. Students describe the underlying mechanisms in their own ways: feeling proud and learning about your strength. A student who was allowed to take the teacher's role emphasized the pride he felt:

“I am proud of myself, because I explained to the teacher how to do it.”

Another eight year old boy explained how he was really proud to show his talent of standing on his head in front of a large audience, including his parents. The teacher's emphasis on the students' talents and competences was clearly recognized in one grade 6. One of the students compared this to her earlier years at school and said:

“It is simply very different, because in our class we work on everything. It is like killing a thousand birds with one stone. Your talents simply arise and that is nice. In previous years, we were always sitting still and we did not know, we had not been able to unleash our talent.”

Another student added:

“It feels really very good, I did not know that it was in me.”

Similarly, a student from grade three reflected on a questionnaire about his talents that he was asked to discuss with his friend and parents and to fill in:

“I am good at quite a few things, but I did not know it. And then at home I looked [on the questionnaire] at all the things I am good at and I saw that I am good at really many things. That made me happy.”

Students also described how drawing on their FoK/I had a positive effect on their *well-being in the classroom*. Marc, whose mother died, says about the letter in the emotion bag which was read to the class:

“It feels nicer, because other children now know about it too.”

A student in grade five who was fasting, was touched that his fellow students were interested in the Ramadan:

“It touched me, because they thought of us, [the students who were fasting]”.

Students also illustrated their *broadened perspectives* and expanded understanding, by telling what they learned about each other's background, religion, culture and talents. A student from a grade three class that made posters about the students' religion and culture, said:

“It was nice, because you learn things you actually did not know and that you actually should know.”

Two girls who tried to eat 'wentelteefjes' nicely explained their change of perspective.

Student 1: “I first thought it was disgusting. We saw it on the plate and we thought: ‘No, ieuw, that is disgusting!’”.

Table 5

Average scores of how nice students found their classmates by group and measurement occasion.

Intervention group				Control group			
Pretest		Posttest		Pretest		Posttest	
M	SD	M	SD	M	SD	M	SD
6.7	2.11	6.68	1.76	7.12	1.82	7.12	1.66

Student 2: "Yes, because it is milk".

Student 1: "And old bread. And then we thought: 'No, we are not going to eat this', but the teacher had made it with the two of them and then we tasted it and then we liked it."

3.4. Effects on the social network in the classroom

Table 5 shows the average score for all dyads per class on the question how nice they found their classmates, by group and measurement occasion.

The analysis of the network data revealed no significant change in students' judgement of how nice they find their classmates (see Table 6). The hypothesis that using students' FoK/I would improve the social network in the classroom therefore has to be rejected.

3.5. Effect on social cohesion in the classroom (teacher perspective)

Although the analysis of the network data did not reveal a significant improvement of the social network in the classroom, the teachers mentioned several positive effects at the classroom level: 1) students knowing each other better, 2) respecting each other, 3) improved interactions between students, 4) common ownership of and involvement in learning, 5) a safe and positive atmosphere in the classroom.

An important effect that teachers described was that students got to *know each other better*, as the attention paid in the classroom to students FoK/I, made them learn about each other's talents, religion, language, culture and background. This contributed to the social fabric of the group. For example, students better understood why their classmate was sad, after his letter about his mother's death was read to the entire class. Getting to know each other better also included seeing new sides of each other. One student in grade six was often noisy, making jokes and disturbing his classmates. However, during a circle conversation moment, when the topic was WWII, he shared his quite detailed knowledge of nuclear bombs. The teacher described how his classmates listened in silence and at the end told the student how impressed they were by his knowledge and how interesting it was. Sharing talents, knowledge, skills, and information about one's culture and background also resulted in new bonds. When a four year old boy told about having seen sheep walking freely in Morocco, another Moroccan boy reacted as he recognized this. Two girls, one very good in gymnastics and the other in ballet, realized their commonalities during a discussion about talents and decided to give a workshop together combining gymnastics and ballet.

As already shown in the example about the nuclear bomb expert, in some cases the new understandings of each other also resulted in more mutual *respect* among the students. In one class, the teacher had observed that children had a lot of prejudices about each other (e.g. one student not wanting to play with children who did not eat meat). An assignment to create and present posters about their culture and/or religion in groups helped students understand each other better, for example realizing why some students do not eat meat, and seeing commonalities between religions. In several classes, students got to see how some of their classmates were fluent in a foreign language. And many unexpected talents were discovered, for instance, a shy girl who impressed her class with her football skills.

Some teachers also noticed changes in how the students *interacted*. In several classes where students exchanged experiences, they listened carefully to each other, were curious and interested in differences, and asked questions. During a break, a boy prepared his asthma medication. This was seen by another student who was usually very shy, but who revealed that he also used this medicine. The teacher decided to give them the floor and together the two boys told the class about asthma. The other children asked questions like how you can get asthma, how one can recover from it, what the medicine tastes like and how quickly it works if you take a dose. In another classroom, during Ramadan students spontaneously started a discussion about Ramadan. Students asked their fellow Muslim students a lot of questions about it and during sports on a hot summer day; they made sure that the fasting students were doing well.

Teachers explained how working with students' FoK/I had a positive impact on their group in terms of *common ownership* and *involvement*. The end of the year musical in grade six, the creation of a traffic square in Kindergarten, the preparation of an exposition for parents about WWII in grade six, the shooting of a movie in grade four and the development of workshops based on talents in grade two, gave students the opportunity to come up with their own ideas, to be the master of their own process and to work as a group towards a common goal. For instance, on the commemoration day of Marc's mother, students decided to take two minutes of silence to remember her, to support their classmate. Students working on their personal records to hold the ball up in a grade 6 class started with a few students, but ended up with many children participating, all encouraging and coaching each other to reach their personal goals. The support the movie director who wanted to give up received is another example.

Finally, teachers mentioned how drawing on students FoK/I helped them create a *safe, positive atmosphere*, where students feel comfortable and confident to be their selves, and dare to make mistakes and share personal stories. The underlying mechanism that teachers point out is that students feel that they are seen by their teacher and fellow students. One teacher describes how a shy student from grade six with reading difficulties felt more at ease and confident after he read out his rap to his fellow classmates, and

Table 6

Test for mean difference between experimental and control classrooms for pre-post average dyadic changes in how nice students find their classmates.

	est.	SE	t-Value	p-Value
v2	-0.11	0.06	-1.7	0.09

consequently volunteered more often to read in front of the class. Solidarity among the students is another characteristic of the atmosphere. Again, the solidarity shown by the classmates of the discouraged movie director is a case in point. The use of 'emotion bags' in another class helped students to openly show and share their emotions: if they were nervous they would get a fiddly thing, or if they were sad they would get something to cuddle. This made it easier for them to talk about their feelings in class.

3.6. Effects on social cohesion in the classroom (student perspective)

Students' comments support the teachers' observation that students acquired knowledge about each other's backgrounds, and thus got to *know each other better*. Students from grade five explained in detail how they learned about the direction in which Muslims pray, and the differences between the Quran and the Bible. Another student more generally commented about the cultural event they organized:

"It was fun, because we learned about the countries of other children, what they do and what they wear."

A group of students explained how during a group activity that involved writing and presenting a rap about sustainability, they learned about other students and their personalities, whether they were shy, or very good at presenting, or how they function in a group. Students explained they also learned about their teacher when she shared her personal immigration story with them.

The *respect* students gained for their classmates' talents was also apparent in the student interviews. Grade six students who engaged in a project that involved writing raps, told how they learned about one girl's talent for writing raps:

"I think she is talented. [...] We did not know about this talent."

Other students described how getting a special role such as being the leader of a group or teaching something to others was exciting and challenging at the same time, but led to acceptance and admiration of their fellow students.

A student of grade five nicely illustrated the *common ownership* that was observed by some teachers, when she tells about how she collaborated with other students on making a rap: "when we do it together, it gets better".

Just like the teachers, students gave examples of how drawing on their FoK/I positively affected the *atmosphere and solidarity in the classroom*. One student of grade four told how there was a limited amount of emotion bags, and thus children offered to share their bags. While Marc's story was shared, one classmate experienced:

"that day quite some children were not busy, but mostly a bit calm [...]. I had the feeling that everyone, me too, had become a bit sadder when we heard that."

A grade three girl told how she took the initiative to search for pictures on prehistory instead of drawing Dragon Ball Z. Quite some classmates became enthusiastic and decided to help her, which she experienced as cooperative and friendly. In grade six students supported their fellow Muslim classmates during Ramadan by not eating either during the breaks when they saw that their classmates were having a hard time.

3.7. Additional effects: effects for the teachers and on the teacher-parent relationship

Teachers also described the effects that drawing on students' FoK/I had on them. First of all it invoked *positive feelings*; they felt happy, satisfied, enthusiastic, touched and proud when they observed positive changes in their students and/or when it produced a tangible result such as a show or end of the year musical. Teachers got energy and inspiration from students' involvement and their enthusiasm to engage in their FoK/I-related activities:

"I always like to see how extremely vibrant a group then starts working. That you actually do not have to do anything, that they all do it themselves and that they are incredibly involved with what they are doing".

A Kindergarten teacher told how her students' enthusiasm made her pro-active and a facilitator asking questions like: "How shall we do this? Maybe someone can bring it from home? Shall we make it ourselves?" Another teacher was happy to see how getting the responsibility for making a movie changed the originally negative atmosphere in the class into a positive climate. A teacher of grade six said he could not wait to come to school every day, when his students were making an end-of-school musical based on their FoK/I. Teachers told how they were deeply touched, for instance when students gave a speech at the premiere of their movie, or explaining how they worked with the emotion bags.

Drawing on students' FoK/I in the classroom *positively surprised* teachers, because they discovered sides of individual students they did not know about. One teacher, for example, had no idea that a shy female student in her class was an outstanding football player. Other teachers were positively impressed by the knowledge some students had about topics such as nuclear bombs, animals, a language, religion, by their skills of using equipment or their working attitude. Some effects at the group level also surprised teachers. Several of them mentioned that students performed and participated far better and more enthusiastically during the FoK/I activities than they had expected, for instance when writing raps, creating workshops, or participating in workshops given by their fellow students.

Teachers explained how working with students' FoK/I had an impact on their *relationships* with individual students and the group. One teacher for example described how giving a student the responsibility of teaching his fellow students a skill, created a relation of trust between them. Other teachers mentioned how the FoK/I-related activities contributed to a positive atmosphere where students and teachers trust each other, share their personal feelings and stories and where everyone feels that they can be themselves.

Finally, as an additional effect, teachers describe how drawing on students' FoK/I positively affected their *relationships with parents*. Students talked about the FoK/I-related activities at home, parents came to the presentations or shows and were proud of their

children. Parents sometimes also got actively involved in the activities: a father helped with the decors and the music for the end-of-school musical, a mother helped editing the movie made by grade four, parents came in and gave a lesson about drawing or a religion. This allowed teachers to build a deeper relationship with those parents.

4. Conclusion and discussion

This study was the first to use a mixed-methods quasi-experimental design for measuring effects of making use of students' funds of knowledge/identity in teaching. Previous studies in this field were either of a theoretical nature or were qualitative case studies of educational projects (for reviews see: Hogg & Volman, 2020; Llopart & Esteban-Guitart, 2017, 2018). We investigated the effects of an intervention that consisted of primary education teachers uncovering and drawing on their students' FoK/I. We were particularly interested in effects in the domains of socialization and subjectification (Biesta, 2010, 2015), which we operationalized as students' personal and social functioning. We also looked at the social network in the classroom (Munniksmä et al., 2013). It was hypothesized that the intervention would positively affect (1) students' social well-being in terms of their relationship with the teacher, (2) their social well-being in terms of their relationships with other students, (3) students' attitudes towards dealing with differences, (4) skills in dealing with differences, (5) the perceived focus on personal development of the lessons in their school, and (6) the social network in the classroom. Based on the analysis of the data from the student questionnaires, all hypotheses had to be rejected; no significant effects were found.

However, in interviews and focus groups teachers and students did report positive effects. Teachers noticed that student engagement in FoK/I-related activities was high, as was already found in previous research (González et al., 2005; Llopart & Esteban-Guitart, 2017). Moreover teacher reported additional effects, in quite some detail: students' learning behavior improved in terms of taking initiatives, responsibility, and acting independently. They also mentioned that the activities contributed to collaboration skills and improved attitudes towards learning; students were challenged to try out activities they previously did not dare, to reflect and to keep practicing, which they did because they were motivated to achieve a good result. For individual students, teachers noticed a positive effect of the attention for their FoK/I on their self-confidence as learners and their well-being more generally. Positive experiences in FoK/I-related activities also affected students' ambitions, some students regaining confidence in their ability to perform well on school assignments. The main mechanism underlying these effects were the students' feeling that their skills and knowledge were valued and the respect they experienced from their fellow students, which in turn made students think more positively about themselves. In addition, receiving positive responses when personal information was shared, made students feel known and accepted. Finally teachers mentioned another type of effect and mechanism: being confronted with aspects of their classmates' lives that were previously unknown to them (food, language, celebrations), provided students with new perspectives and contributed to developing an open mind. In terms of the social cohesion in the classroom, an important effect that teachers described was that students got to know each other better, which contributed to a safe, positive atmosphere in the classroom. Teachers reported increased respect and a reduction of prejudices among the students and improved interaction: listening, being curious and interested, asking questions.

These results call for an explanation of the discrepancy between the quantitative and qualitative data. It is possible that the positive effects mentioned by the teachers merely reflect their own enthusiasm for the FoK/I approach. However, that is improbable, since also students reported positive effects. Another explanation could be that the teachers who participated in the project were already sensitive towards their students' FoK/I. This is not probable either, however; the quantitative data show that there were no differences between the intervention group and the control group on the pre-measurement. The explanation that the intervention period was too short to produce effects is another explanation that can be discarded, because this would not explain the effects reported in the interviews. Nevertheless, a longer intervention period would be recommendable in future research. More probable is that the effects that teachers and students noticed and reported in the interviews concerned events that stood out, but – although they made an impression on teachers and students – were incidental, whereas the questionnaire asked for more general attitudes, feelings and perceptions.

This study has a number of limitations. First of all, several grades and schools working from different educational concepts were involved in the study. This may have contributed to the lack of measurable effects, but also implies that if an effect would have been found it would not have been clear what exactly caused the effect. On the other hand teachers were able to point out the mechanisms they considered to underlie the effects they perceived. Nevertheless, a focus on a particular grade or method of finding or drawing on FoK/I is recommended for future studies. A second limitation is that we used instruments that were available for measuring variables in the social and personal domain, instead of instruments that were particularly attuned to what we aimed to achieve with the FoK/I approach. Maybe, instruments were therefore not sensitive enough to find effects. Future research should try to find or develop instruments that are more suited to measure more subtle changes in the classroom climate and students' individual well-being in the classroom. Finally, we did not ask parents about effects they perceived for their children and for themselves. Since some teachers reported an improved relationship with parents, it would be interesting to include their perspectives as well in future research.

Whereas previous research has suggested enhanced student engagement (González et al., 2005; Llopart & Esteban-Guitart, 2017), academic learning (Subero et al., 2017) and an improved student-teacher relationship as results of using students' FoK/I (e.g. Barton & Tan, 2009), few studies have tried to get insight in actual effects. Despite the lack of significant results, the contribution of this study is that it yielded qualitative indications of the type of effects that may be expected from drawing on students' FoK/I, particularly in the social and personal domain. The enthusiasm of teachers and students about their experiences during the intervention warrants future research into such effects.

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