

Does Using Core Quadrants Lead to More Teacher Self-Efficacy and Less Perceived Problem Behaviour?

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Abstract

PURPOSE. The number of childhood psychiatric classifications and treatments have risen rapidly in Western countries over recent decades. Since child behaviour often arises as a problem in schools, it seems important to find ways to help teachers successfully engage with pupils whose behaviours they experience as challenging. The present study attempts to shift special education teachers' focus from challenging pupil behaviour, or pupil mental disorder, to teachers' self-efficacy and less negative perception of pupil behaviour.

METHODS. Ofman's core quadrant model was used to engage teachers in reflecting on their own key competences, and relate them to possible pitfalls, challenges and aversions in their teaching. The professional development intervention entailed three subsequent team meetings, each lasting two and a half hours. Forty-seven teachers undertook the training, of which half (the control group) were initially put on a waiting list. Via quantitative questionnaires at three different time-points and qualitative post-intervention interviews with teachers involved, we analysed the influence of the intervention on teachers' perceptions of problem behaviour and the grip they experienced on pupil behaviour (via a measure of self-efficacy). In the interviews, room was also made for reporting other outcomes of the training intervention.

RESULTS. Neither quantitative nor qualitative data analysis revealed an effect of the intervention on self-efficacy or perceived pupil behaviour. The interview data suggest that teachers ascribe pupil behaviour they cannot control to factors outside themselves, primarily child mental disorder.

CONCLUSION. Core quadrant training does not seem to alter how teachers engage with challenging pupil behaviour, nor does it help to reduce disorder thinking in special education. Our findings flag up the importance of better educating teachers about disorder thinking on the one hand, while on the other hand seeking ways to reduce the likelihood that teachers run out of pedagogical options, and instead further build up a sense of self-efficacy.

Keywords: core qualities, teacher self-efficacy, medicalisation

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Points of Interest:

- Childhood diagnostic classifications are on the rise in recent decades.
- Teachers often suggest diagnostic investigations of pupils, because they believe this will explain difficult behaviour or academic underperformance.
- A training aimed to shift the focus from disorder within a child to teacher's own key competences, pitfalls, challenges and aversions, failed to change self-efficacy, behaviour perception and disorder thinking in teachers.
- To reduce disorder thinking in schools, simply educating teachers about what disorders are not and cannot explain, might be more effective than training programs, like studied in the present research.

Introduction

Diagnostic rates of mental disorders in children have been on the rise in recent years across Western countries (Batstra et al., 2021; Olfson et al., 2014). At the time of writing, an estimated one in eight children meet the criteria for a mental disorder (Barican et al., 2021). Mental disorders are defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM)—an internationally used handbook of clinical psychiatry. The present and fifth edition appeared in 2013, and its text revision in 2022 (American Psychiatric Association, 2013/2022). According to Allen Frances, the chair of the fourth edition that was issued in 1994, the DSM-IV in particular contributed to an ‘epidemic of childhood disorders’ (Frances & Batstra, 2013). The DSM-IV’s editorial task force had not anticipated that the minor changes they made to the definitions of, for example, ADHD and autism would bring about astounding increases in childhood diagnoses and treatments. The unexpectedly great rise in the number of childhood diagnoses has since been attributed to a range of social and particular interest factors, such as profit, that mediate the interaction between child behaviour and mental disorder diagnosis. The unintended consequences of the minor changes made to childhood mental disorder definitions can therefore not as readily be undone.

While the DSM was originally intended to facilitate mental disorder communication among professionals in the field, under the influence of the pharmaceutical industry and biological psychiatry, a biomedical framing of the disorder categories soon became dominant (Lafrance & McKenzie-Mohr, 2013; Mills, 2022). The biomedical model of mental disorder places the cause of emotional and behavioural problems with or of a child, in the child and the child’s brain (Heagle & Hodge, 2016). While no biological or genetic markers are found for any mental disorder (Frisch, 2016; Scull, 2021), the biomedical, disorder-based framing of mental health problems as brain defects predominates in public information, including in study books (Te Meerman, 2019), information books aimed at children (Batstra et al., 2020), public science communication (Gonon et al., 2011), and the media (Ponnou et al., 2020). The biomedical perspective also greatly influences educational settings (Batstra et al., 2021) where issues concerning both behaviour and learning often initially arise, and where there are fast routes in place to psychiatric investigation (Russell et al., 2016; Sax & Kautz, 2003; Wienen et al., 2019). International monitoring data have pointed to teachers reporting high levels of stress due to disruptive classroom behaviours, although variation is noted by country and by teachers’ age: young teachers find maintaining order more challenging, while older teachers sooner report workload as a stress factor (OECD, 2020). While teachers call for professional development in teaching pupils with special educational needs, relations between teachers and pupils have reportedly improved since 2008 (OECD, 2019). In a Swedish study, teachers scored high on self-reported inclusive education skills (Thoutenhoofd et al., 2020).

Although the bio-psycho-social model is often theoretically advocated (e.g., Kranzler et al., 2020), in practice teachers not always have the time and means to influence psychological and social determinants of behavioural or learning issues, and referral to special services for diagnosing and treating the problem may therefore be tempting. While a formal psychiatric diagnosis merely *names* patterns of behaviours

experienced as problematic, teachers often suppose that it *explains* deviancy or poor academic results (Degroote et al., 2022).

In addition, putting in place a mental disorder label as explanation for educational problems excuses all parties concerned, children, parents and teachers. This often opens the way to new, better collaboration between parents and teachers in organising optimal educational pathways for a child (Honkasilta et al., 2016). However, a mental disorder diagnosis also places the cause of experienced problems single-sidedly in the child and the child's brain, so that the child can easily experience (self-)stigma and feelings of inferiority (Batstra et al., 2012), under-perform as a consequence of teachers' lowered expectations (Franz et al., 2023; Metzger & Hamilton, 2021), and in the longer term, experience exclusion in education and in work (Ringbom et al., 2022).

A second disadvantage of labelling school children with a mental disorder is that teachers attend less to contextual factors that may trigger problems in a child's behaviour or learning, once behaviours are given a mental disorder label. Possible solutions that may be located in context may then be overlooked, since the disorder label is falsely assumed to 'explain' the behaviour, rather than merely naming it. When teachers assume that mental disorders cause problems, they are also less alive to their own influence and various pedagogical options in working with the child (Kazda et al., 2021; Te Meerman et al., 2017). In effect, their professional self-efficacy in addressing classroom problems reduces as a consequence of the causal misattribution to biology.

Teachers' self-efficacy concerns the extent to which teachers feel able to pedagogically influence pupils' behaviour and learning (Barni et al., 2019; Khan et al., 2015). A high degree of experienced self-efficacy is associated with higher motivation and better academic performance among pupils, better relations with pupils and between pupils, and the ability to address challenging behaviour from pupils in the classroom (Hussain & Khan, 2022). Teachers who score high on self-efficacy measures also find the behaviours of their pupils less challenging (Meijer & Foster, 1988).

In summary, since publication of the DSM-IV in 1994 (American Psychological Association, 1994), the rates of diagnoses of childhood disorders have taken an enormous unintended flight, while psychiatric investigation of child behaviour is often and most readily initiated in schools and in educational contexts. It is often falsely supposed that a diagnostic label explains unwelcome behaviour or poor academic performance in children. Should it be considered desirable to curb the unintended rise in childhood mental disorder diagnoses, then education is a clear target for intervention work. Raising self-efficacy among teachers can be a good first aim. Key assumption is that as teachers have more grip on their own pedagogical influence and abilities, they should prove less inclined to attribute the cause of classroom problems they experience to individual pupils' supposed brain defects.

A well-developed and simple method to have people reflect on the (professional) interaction between themselves and others is the 'core quadrant' approach developed by Ofman (2001). Formulated in its Dutch origins as *kernkwadrant*, the model has been used in professionalisation courses in organisations and in schools in the Netherlands for close to two decades. Although not developed for that purpose, the model might contribute to demedicalisation in schools by shifting the focus from problems within the child towards problems in the interaction and specifically, unfortunate combinations of teacher and pupil characteristics. In line with social as opposed to medical models of disability (Oliver, 2013), core quadrants may stimulate teachers to work more from the standpoint that children are not disabled by their challenging characteristics, but by barriers they face in contexts that do not give room to diversity (Batstra et al., 2021).

The core quadrant approach is a product entirely of and for practice, and is neither theorised, nor has it so far been linked to a framing theory. Being primarily set in professional practice, the effectiveness of the approach has, as far as we know, not so far been scientifically assessed or evaluated. It is however clear that the model addresses soft skills (Gibb, 2014), personal attributes such as self-efficacy that enable a person to engage effectively with others. The importance of soft skills has for example been expressed in an OECD report (OECD, 2015), which has called for their further development and implementation in education. In scholarly circles, the general context of soft skills is the study of lifelong learning, which is assumed to entail not only cognitive but also emotional and social dimensions (Illeris, 2011). Via that route, theoretical frames associated with soft skills and lifelong learning may help to

frame Ofman's core quadrants approach, including control theory (Carver & Scheier, 1982; Ramaprasad, 1983), goal setting theory (Locke & Latham, 1990), self-efficacy theory (Bandura, 1977; Donohoo, 2018), and attribution theory (Eberly et al., 2011). An exploration of suitable theoretical groundings for the core quadrants approach is however not attempted in this paper.

In the present study, we aimed to determine whether a teacher professionalisation intervention based on the core quadrant model can help to shift teachers' focus from problem behaviours in pupils to teachers' own professional capacity for navigating pupils' problem behaviours. The core quadrant model puts the teacher at the centre of teacher-pupil interactions and in doing so presupposes that continuities exist between teachers' key competences and their personal pitfalls, challenges and aversions. A teacher who, for example, is meticulous (a key competence) can take precision too far and so become fussy (pitfall), which brings about extra work. It might then make sense to ease up a little and be less worried about occasional mistakes (challenge). Since doing so may prove difficult to do, it may lead to feeling annoyed about pupils who are sloppy or ineffective in their learning (aversion). Should it prove possible to have teachers engage in spotting associations and continuities of this sort in their competence and personality, then teachers might be less inclined to blame pupils for classroom problems and focus more on their own role and what they can do to raise their impact on pupils. We anticipate that getting teachers to focus on themselves rather than on pupils when problems arise in the classroom will, in effect, raise their self-efficacy and their grip on pupil behaviour, because in working with the core quadrant teachers practice seeing themselves as key agents in shaping and managing their teaching relations with pupils. In addition, we expect that training in the use of core quadrants will lead to teachers being less likely to consider pupils' behaviour challenging or problematic.

Method

In order to investigate these hypotheses, a pilot study was undertaken that combined quantitative and qualitative data collection, and analysis. Via questionnaires at three different time-points in a professional training intervention and post-intervention interviews with teachers involved, we determined the influence of the core quadrant properties on teachers' perceptions of problem behaviour and the grip they experienced on pupil behaviour (via a measure of self-efficacy). In the interviews, room was also made for reporting other outcomes of the training intervention. Since our focus is on studying the perception of problem behaviour in light of mental disorder labelling, we chose to conduct our study in special education settings where a majority of pupils have a mental disorder diagnosis.

Participants

Participating teachers work in a special education school in the North of the Netherlands. This type of school is especially meant for children who have learning difficulties, low IQ scores, and behavioural problems like hyperactive, oppositional, anxious or socially awkward behaviour. Before a child is accepted to one of such schools, it undergoes several evaluations and tests, and their parents and regular school teachers are often extensively questioned. An education consultant carries out this research, and gives advice about school choice.

Forty-seven teachers voluntarily joined the study and underwent the core quadrant training. The teachers were averaged 44 years in age (age range: 23-67, $SD = 11.31$), and at the time of joining the study had been employed in education for an average of 19 years (range: 0-38, $SD = 10.38$). Among the group of participants, 81.8% are female, and 18.2% male. A majority of them (88.6%) obtained a tertiary professional education diploma, while 4.5% undertook university education.

Procedure

Informed consent was sought from participants for both the quantitative and the qualitative data collection. The relevance of the study was highlighted in prior information forms that were sent out, and it was also clearly explained to recruits that participation was voluntary, and that participants could

withdraw at any moment from the study. The prior information explained how and what data are collected and stored, and who can access personal information and/or the pseudonymised data sheets. The research ethics committee of the Pedon Department at Groningen University approved the study. The study has a quasi-experimental research design. Teachers who agreed to join the study were allocated to one of four teams on the basis of their availability. Two teams ($n = 22$) undertook professional training in the use of core-quadrants, while two other teams ($n = 25$) were initially placed on a waiting list, and during this waiting period served as control group. Both the intervention and the waiting list group completed a questionnaire before the start of the training, another immediately following the training, and a third 10-12 weeks after the training ended. Efforts were made to avoid participants influencing members in the other group as much as possible in the meantime. All teachers in the initial intervention groups completed the pre-intervention questionnaire—17 of them completed the post-intervention questionnaire, and 18 the follow-up questionnaire. At the same time points, 22 of the 25 waitlisted teachers completed the pre-intervention questionnaire as control group, 17 the post-intervention questionnaire, and 17 the follow-up questionnaire. After the follow-up questionnaire, the waiting list group also received the professional training in the use of core quadrants. Their follow-up questionnaire data as control group therefore also served as pre-intervention questionnaire as intervention group. In their intervention phase, they were also asked to complete the questionnaire immediately following the training and once more 10-12 weeks later, to which 12 of them complied in both instances. After completing the training, all participants were asked in the follow-up questionnaire if they would agree to being interviewed about the effect that the training had on them. Of the 47 teachers 13 agreed, and were interviewed within 4 weeks of completing the follow-up questionnaire.

Materials

The Training

The intervention (Van Roy & Batstra, 2021) is based on Ofman's (2004) core quadrant model. In this study, the model is used as a framework to engage teachers in reflecting on what they see as their own key competences, and relate them to possible pitfalls, challenges and aversions in their teaching. The professional development intervention entails three subsequent team meetings, each lasting two and a half hours. During the first meeting, team members engage each other in open conversation about their own key competences and the other three attributes (pitfalls, challenges and aversions) of the core quadrant. Debate and dialogue are alternated with practical assignments, like filling in a list about which pitfalls and challenges may relate to specific core qualities of which core qualities are present or missing in the teacher team. In the second and third meeting, under the guidance of the trainer, participants practice with completing core quadrant schemes and share their results with group members. The teams zoom in more closely on tricky combinations of teachers' core quadrant attributes, and particularly pupils whom they experience as especially challenging in their teaching. This involves looking at teachers' own share of interacting with and relating to these pupils from each of the core quadrant's attributes in turn. A gap of three weeks is left between meetings, during which participants practice using the core quadrants model in their classrooms on the basis of structured assignments they carry out. For example, teachers are asked to film themselves in an interaction with a pupil they experience as challenging and to observe the video in detail, thereby focussing on their own behaviour in the interaction and how this may relate to their own challenges, pitfalls, qualities and aversions.

The Questionnaires

In the quantitative part of the study's data collection, a key assumption is that the training will impact teachers' self-efficacy and problem behaviour they see in pupils, as measured by self-reporting questionnaires.

The variable self-efficacy of teachers is measured on interval scale, using the short version of the Teacher Self-Efficacy scale (TSES), based on Bandura's social cognitive theory (Schwarzer et al., 1999). The scale entails 10 questions formulated in the form of 'I can...' or 'I have the capacity to...'. The questionnaire targets four major areas of the teaching profession: job accomplishment, skill development on the job, social interaction with students, parents, and colleagues, and coping with job stress. Questions use a four-point scale that ranges from 'not at all true' (1) to 'hardly true' (2), 'somewhat true' (3) and 'completely true' (4). An overall average score is calculated over the 10 questions; the higher the score, the more self-efficacy is experienced.

Reliability of the questionnaire is calculated with Guttman's Lambda (Sijtsma, 2009), and was $\lambda-2 = 0.70$, $\lambda-2 = 0.65$, and $\lambda-2 = 0.77$ at pre-test, post-test and follow-up respectively.

Teachers' perception of problem behaviour in pupils is determined by their total score on the Strengths and Difficulties Questionnaire (SDQ; Widenfelt et al., 2003). This screening list investigates the skills and psychosocial problems of young people aged 2-17, and comes in different versions for parents, young people themselves, and teachers. This study used the SDQ for teachers, which they were asked to fill in for one pupil whose behaviour was most challenging to them in the teaching context. The total score of the SDQ entails four sub-scales with 5 items each: emotional problems, behavioural problems, hyperactivity/attention deficits, and problems with peers. Item scores vary on a three-point scale from 'not true' (0), 'somewhat true' (1), to 'completely true' (2). A total score is calculated by summing up the answers to the SDQ's 20 questions. The higher the total score, the more problems are experienced. Reliability of the SDQ's 20 items is calculated for the pre-intervention ($\lambda-2 = 0.94$), post-intervention ($\lambda-2 = 0.83$), and follow-up ($\lambda-2 = 0.77$) questionnaires.

The Interview

Thirteen teachers were interviewed following the core quadrant professional development training, using a semi-structured interview design. Semi-structured interviews offer room for respondents' own input (Flick, 2020). Using an agreed written interview guide, all interviews were taken by one and the same interviewer. The interview questions covered questions such as whether core quadrant training had influenced respondents' perception of problem behaviour in pupils, whether it affected the grip they had on pupil behaviour, and what other outcomes from the training are worth noting.

Analysis

Quantitative Data Analysis

The quantitative data analyses are done using Statistical Package for the Social Sciences (SPSS) 28. First, independent *t*-tests are conducted to examine if there exist initial differences in self-efficacy and perceived problem behaviour between the experimental and control group. It was examined if the assumptions for these tests are met. Levene's test indicated homogeneity of variance between the two groups for both self-efficacy, $F = 0.77$, $p = .38$, and perceived problem behaviour, $F = 0.96$, $p = .33$. Moreover, histograms showed that the distributions of the outcome variables were approximately normal in both groups.

Effects of the core quadrant intervention on teachers' self-efficacy (TSES), and their perception of problem behaviour (SDQ) are analysed using two mixed regression models. In the mixed models, the independent variables are group (intervention versus control), time (pre-intervention, post-intervention and follow-up), and the interaction of 'group by time.' Self-efficacy and perception of problem behaviour in pupils are the two dependent variables. A random intercept is used in both models.

Mixed models were fitted because they use all available data, and do not require the error terms of observations stemming from one individual to be independent, which makes it suitable for the analysis of repeated measures (Detry & Ma, 2016). With linear mixed models, it is assumed that both the higher level random effects and the residuals of the outcome variables are distributed approximately normally. This assumption was met in the current models. Mixed models do not have to adhere to assumptions of

homoscedasticity and sphericity (Quené & Van den Berg, 2008). For each model, an optimal fit covariance structure is selected using the Akaike Information Criterion (AIC).

Qualitative Data Analysis

Data analysis of the 13 interviews involved data coding of interview transcripts and assigning codes to a number of themes found to fit the codes. A thematic analysis is useful for inductively identifying, analysing and reporting patterns (themes) within data (Flick, 2020).

The interviews were analysed using Atlas.ti. Two researchers began by reading all interviews and familiarising themselves with the data. Following that, a first interview transcript was chosen in which both researchers independently selected passages relevant to the research questions. In this initial effort, the two researchers overlapped 90% in their selections. The selected passages were compared, and differences between them were discussed. Comparable contents were brought together under an initial list of codes that seemed key terms for those passages. A first codebook was developed from the discussions, with which the first and a second interview were analysed. The researchers independently and separately determined which codes applied to the transcripts, and what new codes needed to be added. This was followed by shared discussion and comparison in which new agreement on codes and coding was sought. With this new agreement further transcripts were also coded, until a stable codebook and coding agreement emerged after the fifth transcript was analysed.

Following data coding of all transcripts, an intercoder reliability score was calculated for all coded transcripts using Cohen's kappa; the intercoder reliability was found to be good ($K = .703$).

Results

Quantitative Analysis

Baseline Score

No significant difference was observed between the experimental and control group regarding self-efficacy, $t(60) = 0.56$, $p = .70$, or experienced problem behaviour in pupils, $t(60) = -0.39$, $p = .58$. Teachers in both the experimental group ($M = 3.54$, $SD = 0.27$), and the control group ($M = 3.50$, $SD = 0.25$) scored relatively high on the pre-intervention TSES self-efficacy measure. The experimental group ($M = 15.75$, $SD = 4.53$), and control group ($M = 16.23$, $SD = 4.64$) both reported 'heightened' scores on the SDQ pretest measure of experienced problem behaviour in pupils that borderline clinical problem behaviour (Stone et al., 2015).

Core Quadrant Training Effect on Self-Efficacy (TSES Results)

In the analysed mixed model, the interaction term group-by-time shows the extent to which the intervention group TSES scores vary from the control group scores over time. The inclusion of the interaction group-by-time does not significantly improve the fit of the first regression model, $F(2, 149) = 0.23$, $p = .79$. This means that, overall, the self-efficacy of teachers in the experimental group did not increase appreciably more in following the core quadrants training, than it did among teachers in the control group (see Table 2). The main effects of the variables group, $F(1, 149) = 0.28$, $p = .60$, and time, $F(2, 149) = 1.69$, $p = .19$, on self-efficacy also did not reach statistical significance. Table 1 lists the beta coefficients for the regression of the first mixed model on self-efficacy.

Table 1
Regression of Intervention Over Time on Self-Efficacy (TSES)

Group	<i>B</i>	<i>SE</i>	<i>t</i>	Sig.	95% CI	
					Below	Above
Intercept	3.49	0.06	63.30	<.001	3.38	3.60
Post-intervention [time = 1]	0.07	0.05	1.39	.17	-0.03	0.18
Follow-up [time = 2]	0.01	0.06	0.15	.88	-0.11	0.13
Experiment [group = 1]	0.04	0.07	0.55	.58	-0.10	0.17
Experiment [group = 1]*post-intervention [time = 1]	-0.03	0.07	-0.48	.63	-0.16	0.10
Experiment [group = 1]*follow-up [time = 2]	0.01	0.08	0.16	.87	-0.14	0.17

Note. For a group, the reference level (0) is the control group. For time, the reference level (0) is pre-intervention.

Table 2
Average Reported Self-Efficacy (TSES) at Pre-Intervention, Post-Intervention and Follow-Up Time of Measure

Group	Time ^a	<i>M</i>	<i>SE</i>	95% CI	
				Below	Above
Experimental group	T1	3.53	0.04	3.45	3.61
	T2	3.57	0.05	3.48	3.66
	T3	3.55	0.05	3.46	3.64
Control group	T1	3.49	0.06	3.38	3.60
	T2	3.56	0.06	3.45	3.68
	T3	3.50	0.06	3.38	3.62

^aT1 = pre-intervention, T2 = post-intervention, T3 = follow-up.

Core quadrant training effect on experienced problems in behaviour of pupils (SDQ results)

The inclusion of the effect of group-by-time did also not lead to a significant improvement in the fit of the second model, $F(2, 149) = 1.54, p = .22$, which shows that, overall, the core quadrants training did not significantly reduce the perception among teachers of problem behaviours in pupils. There were also no significant main variable effects found for group, $F(1, 149) = 2.68, p = .10$, or time, $F(2, 149) = 0.56, p = .57$, on teachers' perception of problem behaviour in pupils. However, while not significant, a trend is observed whereby teachers who have followed the core quadrant training report less problem behaviour in pupils at post-intervention and follow-up measures than in the pre-intervention measure, while the perceived problems behaviours in pupils rises among teachers in the control group between pre-intervention and post-intervention measures (see Table 4). The beta coefficients of the mixed regression model on experienced problem behaviour are listed in Table 3.

Table 3*Regression of Intervention over Time on Teachers' Experienced Problem Behaviour in Pupils (SDQ)*

Group	<i>B</i>	<i>SE</i>	<i>t</i>	Sig.	95% CI	
					Below	Above
Intercept	16.39	1.02	16.02	<.001	14.37	18.41
Post-intervention [time = 1]	-0.41	1.20	-0.34	.74	-2.79	1.97
Follow-up [time = 2]	1.00	1.23	0.81	.42	-1.43	3.43
Experiment [group = 1]	-0.58	1.28	-0.45	.65	-3.10	1.95
Experiment [group = 1]*post-intervention [time = 1]	-0.77	1.51	-0.51	.61	-3.76	2.21
Intervention [group = 1]*follow-up [time = 2]	-2.64	1.52	-1.74	.09	-5.65	0.37

Note. For a group, the reference level (0) is the control group. For time, the reference level (0) is pre-intervention.

Table 4*Average Perception among Participating Teachers of Problem Behaviour in Pupils (SDQ) at Pre-Intervention, Post-Intervention and Follow-Up Time of Measure*

Group	Time ^a	<i>M</i>	<i>SE</i>	95% CI	
				Below	Above
Experimental group	T1	15.81	0.77	14.30	17.32
	T2	14.63	0.87	12.91	16.34
	T3	14.17	0.86	12.48	15.86
Control group	T1	16.39	1.02	14.37	18.41
	T2	15.98	1.13	13.74	18.22
	T3	17.39	1.13	15.14	19.63

^aT1 = pre-intervention, T2 = post-intervention, T3 = follow-up.

Waiting List Group vs. Training Group

Two further mixed models were analysed in order to determine whether the effect of the intervention over time differed between the group of teachers initially on the waiting list versus the group of teachers taking the core quadrant training first. The effects of the core quadrant training on self-efficacy, $F(2, 93) = 0.04$, $p = .96$, or experienced problem behaviour in pupils, $F(2, 93) = 0.52$, $p = .60$, did not differ between the two groups, therefore the results reported above concern the combined group only.

Qualitative Analysis

The themes and codes arising from the qualitative analysis of interview data are summarized in Table 5 and discussed below.

Teachers' Perception of Problem Behaviour in Pupils

The influence of the core quadrant training on teachers' perception of problem behaviour in pupils is judged slightly different among participating teachers. Seven of the 13 teachers interviewed after the

training generally experience no effect: “It is more awareness raising than actually changing my perception.” The other teachers reported contradictory effects, by for example first denying changed perception, but later in the interview saying, for example: “Something did stay around in me, namely that you do start to look differently at a pupil after filling in a core quadrant.”

Pupil behaviour that teachers experienced as problematic include agitated, oppositional, gloomy, spoilt, quiet, aggressive, cheating, unmotivated, feeling victim, and generally inflexible or nervous demeanours. Oppositional behaviour is most often mentioned, followed by spoilt behaviour. Teachers experience pupil behaviour as difficult when they have no grip over it and feel powerless: “That pupil ended up with ... he was taken out of class, since well, he just had, ehm ... And sure, then you really do feel very powerless because nothing works, so to say.”

Table 5

Themes and Codes Arising from the Qualitative Data

Theme	Codes	Description
Perceived problem behaviour in pupils	Variation	Contradictory training effects are reported by 6 teachers, while 7 report nil effect.
	Diverse	Teachers experience problem behaviour in pupils as highly diverse.
	No grip	Generally shared is that pupil behaviour outwith teacher control is experienced as problem behaviour.
Grip on problem behaviour	Variation	Contradictory training effects are reported by 4 teachers, while 9 report nil effect.
	External explanation	When teachers report a lack of grip on pupil behaviour, the explanation for this is sought outwith teaching; often in an underlying disorder, but also in pupils' home situation, the education system or in society.
Awareness	Own role	Teachers generally report being more aware after the training of their own role and impact.
	Problem behaviour pupils' positive sides	Teachers generally report being more alert to the positive sides of pupils after the training.
	Affirmation of doing well	Teachers generally report that the training affirmed their teaching efforts.

Having Grip on Pupils' Problem Behaviour

Having a grip on pupil behaviour is therefore very important, but 9 out of 13 teachers report this grip not having improved with the core quadrant training: “Well, not because of the training, no, no.” Four teachers do name an improvement: “[...] what are the allergies, where can we help one another? So that gets you thinking and [...] I notice that we therefore [...] have more grip on her behaviour and how she does that.” Also, in relation to the theme of having grip, teachers reporting positive results of the training oftentimes in the same interview also claim not to experience more grip after the training.

Notable is that almost all interviewees (12 out of 13) seek explanations for the problem behaviour they encounter in pupils, outside themselves and their teaching. A majority of teachers see disorders as suitable explanation, even though sometimes implicitly. For example, it was noted that: “A diagnosis confirms that this is a part that really is outside of your control [as teacher],” and “Then it goes, not as an excuse or anything, like, ‘Oh, there is something behind that [...], that helps again too.’ For example, my brother has had it investigated at age 37 and he now says, ‘Oh, if only I had known this sooner, then I would have known what caused this’.” Other explanations beyond teachers’ own capacity or control are society and education making great demands of pupils: “But I, I think also that education in general asks a very great deal of the children, so that those children probably think, ‘Ah well, no way I can do all of that.’ And which gives you that negative self-image they can have. And yes, I too think that a lot is being asked of children, of no more than 12 already.” A final explanation of behaviour that eludes teachers’ grip is the home situation of some pupils: “A boy like that does not peep and squeak for no reason. And that is also learnt at home and that is inside that boy. I call it pamper behaviour, parental care keeping children shielded and protected from all sides.”

Awareness

One word that is used various times in each interview about the effect of core quadrant training is “awareness.” First of all, teachers report being more aware of their own role and impact: “Well, more aware in the sense that you are to some extent a mirror, and that the behaviours of pupils are in part influenced by what I do.” Teachers may then also look more critically at their own peculiarities and behaviour: “My pitfall is that I can sometimes be a little too easy-going. [...] I can then think, “Whatever, okay guys. We’ll just roll with that”, as it were. But whenever I am like that, I do also notice that those children become a little more fidgety like, since the guidance is less present.”

Moreover, teachers report that they are more aware of the positive sides in pupils showing challenging behaviour: “And I have started to appreciate his qualities. And that has worked out well. [...] Well, this little chap is verbally very strong, and that irritated me. But because the training encouraged me to look at that differently, I now have a really positive connection with him.” Another teacher noted: “[...] that you think to yourself, “Oh yeah, what is nice about him? Ah yes, humour.” So that you realize that this is a nice side to him.”

Finally, 12 out of the 13 teachers interviewed say they received positive reinforcement of their pedagogy from the core quadrant training. They feel that they are doing well, and can achieve quite a lot with their pupils. This affirmation gives teachers confidence in their abilities: “It has brought about the thought that, “Oh, I see [...] just see what we have achieved. We should be proud of how it goes and what we do [...]. [...] it is a brief eye opener and a reminder of yes, just look at all we can and are doing”.”

Conclusion and Discussion

Conclusion

Following our study of the influence of professional training in using the core quadrant model on teachers’ perceptions of problem behaviour in pupils and the self-efficacy of teachers employed in special education, we conclude that a clear, self-conscious effect of the core quadrant training is absent in the quantitative as well as the qualitative data we collected. Notable is that 10 out of 13 interviewed

teachers name disorders as explanation for pupil behaviour on which they feel they have little grip. In addition, every teacher we interviewed noted that the training brought about greater awareness of teachers' own role and influence, alongside greater awareness of challenging pupils' positive sides. Finally, the training confirmed teachers in their belief that they were often already on the right track in navigating pupils' challenging behaviours.

Discussion

A noteworthy finding from the study is that teachers scored highly on self-efficacy already before the core quadrant training, as well as on the extent to which they experience the behaviour of some pupils as challenging (namely, within clinical range). Other studies concluded that teachers with high scores on self-efficacy were less likely to experience pupil behaviour as troublesome (Meijer & Foster, 1988). One possible explanation for the observed difference is that the participants of the present study are employed in the special education sector. This is a setting in which challenging behaviour is relatively frequent, while teachers working there have opted to work in a context of more frequent challenging behaviour from pupils.

Since teachers already showed high scores on self-efficacy pre-intervention, there were little gains to be had from the core quadrant training intervention in that regard. The qualitative interview data, too, showed that teachers gained primarily in confirmation that they are already working along the right lines in navigating challenging behaviour among pupils. As for the perception among teachers of problem behaviour in pupils, this study revealed a trend in which teachers' scores on the SDQ lowered following the core quadrants training from within clinical range to borderline clinical range. This trend was however not significant, which may mean that there was no training effect, or that the relatively small sample size, along with high study withdrawal rates, impaired the statistical power needed for a significant effect. The relatively short duration of the intervention may also have affected the scores: it is possible that three intervention meetings are insufficient to establish marked change. Some teachers were ambivalent about the effect of the training on their perception of problem behaviour in pupils. This may well relate to the raised awareness that teachers all named an outcome of working with core quadrants. Especially the strengthened reminder of pupils' positive sides seems to have contributed to teachers noting being better able to tolerate challenging behaviour among pupils. The level at which problem behaviour in pupils is being perceived is then conform the SDQ results that were found: while no significant reduction is found on the SDQ, the extent to which teachers can tolerate problem behaviour may perhaps have increased.

This is not without interest, since it was also found in the study that when teachers are less able to navigate behaviour they experience as troublesome in pupils and they feel they have no grip over such behaviour, they seek explanations outwith their teaching and the classroom. The very idea of using core quadrants is precisely that teachers should focus on the influence they themselves have on interaction with pupils (Buttner et al., 2015), while seeking less recourse in ascribing problem behaviours to mental disorder. The interviews clearly show that the training failed in that regard, which may suggest that the misconception that a mental disorder explains behaviour problems is persistent, maybe because it offers teachers a convenient way out when they feel they run out of response options. This would tally with other studies on that topic (Degroote et al., 2022; Wienen et al., 2019), and flags up the importance of better educating teachers about disorder thinking on the one hand, while on the other hand seeking ways to reduce the likelihood that teachers run out of pedagogical options, and instead further build up teachers' sense of self-efficacy.

Strengths and Weaknesses of the Study

In this study the sample was small and non-response on the questionnaires fairly large, which could explain the lack of significant findings. Non-response was particularly high among participants who first belonged to the control group and then became an experimental group. This is understandable, since they were asked to complete questionnaires five times. For these, but also for the teachers who 'only'

completed questionnaires at three points in time, an additional drawback is that filling in the same instruments several times, can condition answers because previous answers are remembered. Another limitation of the study is that self-efficacy (TSES) scores were already high at pre-intervention measure, which made further gains less likely.

A strong element in the study is that the quantitative measures could be supplemented with qualitative data taken from interviews. The picture that emerges from the interviews is less that of no effect, and more of a variable influence of the training on different participants, and some interviews suggesting teachers themselves being ambivalent and even at times self-contradicting about training effects. The interviews furthermore gave teachers opportunity to raise other outcomes of the training than were investigated via the quantitative data collection instruments, and teachers did indeed report other outcomes. The inter-rater reliability of data coding was moreover sufficient to take the qualitative part of the study into serious consideration.

Implications

For Further Research

A first implication of the present study is that it seems useful to use both quantitative and qualitative data collection instruments in studying the effects of training interventions on practice, because a more holistic view emerges from their combined use. It might be useful to conduct a comparable intervention in regular education, because teachers in regular education may generally score lower on self-efficacy than teachers employed in special education settings. The present study confirms that when teachers feel they lose their grip over pupil behaviour they seek explanations for such behaviour outside their teaching, primarily in childhood disorders (Wienen et al., 2019). This causal misattribution means that reinforcing teachers' self-efficacy can likely help reduce the presently high number of referrals—primarily from within regular education settings—made of pupils for psychiatric investigation. This way, it may contribute to inclusive education in mainstream schools.

A second research implication is therefore that it does seem useful to further investigate the role that soft skills—whether or not conceived in terms of attributes targeted in Ofman's core quadrants model—seem to play in teachers feeling that they lose their grip over pupil behaviour, alongside investigating possible explanations for those feelings in the three dimensions of teaching competence covered by lifelong and professional learning: cognition, emotion, and social interaction.

For Practice

We do not at present, and on the basis of present findings, recommend using core quadrants in special education settings; or at least not in relation to mediating how teachers navigate problem behaviour in pupils. The level of self-efficacy experienced by teachers in special education settings is already high, and professional training itself is less likely to raise that further. The extent to which pupil behaviour is experienced as troublesome does seem to lower a little following the core quadrant model training intervention, but the effect is not significant. It should be noted that this lack of significant effect might also be explained by the limitations concerning the sample size. The post-intervention interviews with participating teachers do suggest that core quadrants can be useful to raise awareness among special education teachers about their own role and influence on pupils, and the positive attributes of pupils showing challenging behaviour. This means that the model can possibly help in situations where a teacher is locked in a persistently challenging situation with a pupil, and so the model might have incidental practical value.

Further, the study's interviews show that teachers primarily judge pupils' behaviour they cannot effectively respond to, to be explained by an underlying disorder. Hence, to reduce disorder thinking in schools, simply educating teachers about what disorders are not and cannot explain (Sluiter, 2021) might be more effective than training programs like studied in the present research.

We may, finally, briefly speculate on the possible idea that the present lack of clear theoretical grounding is standing in the way of teachers seeing value in the core quadrants approach. If so, we might suppose that if teachers had been presented with the core quadrants approach in a clear context of developing soft skills thought to help them more explicitly identify causal patterns in problems they experience, better control and self-regulate their teaching, and better achieve their personal goals, then the approach might have found greater favour and use among participating teachers.

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