University of Twente
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MSc Positive Clinical Psychology and Technology
Master thesis

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Using mindfulness in education

The benefits of using a mindfulness mobile app for teachers

By

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Abstract

This study aimed to explore the perceived benefits regarding level of burnout, mindfulness, well-being, and feasibility and preliminary efficacy, of using a mindfulness-based smartphone app, called the *Super Chill Mindfulness app*, in a sample of teachers from elementary schools across the Netherlands. The design of this study is explorative, mixed methods, using a cross-sectional design, with four quantitative measures. In the first phase, surveys were applied and semi structured interviews were used in the qualitative phase. The participant sample consisted of 22 teachers from different elementary schools across the Netherlands (mean age 43.63 years, SD = 9.76), including 3 males, 18 females and 1 gender unspecified participant. Participants were asked to fill out a survey after which a sub-sample of 3 teachers attended a semi-structured online interview with the researcher. Some significant results were found in terms of changes in the level of work engagement, mindfulness and wellbeing. The qualitative thematic analysis of the interviews revealed that there is a need and a big motivation for including mindfulness into the school curriculum, as the teachers commented on the number of benefits that mindfulness practise brings not only to them, but also to their students. All teachers within this sample scored high in the level of work engagement. Concluding, the findings indicate that mindfulness in education can be a beneficial and, in combination with the app-based approach, also a cost-effective and time-effective tool to decrease teachers' burnout and attrition. Further studies in this area, preferably in a randomized controlled design, are needed.

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1. Introduction

1.1. Well-being of teachers in primary and secondary education

Teachers across the globe have been experiencing high amounts of workload (Ballet & Kelchtermans, 2009) and emotional exhaustion (Skaalvik & Skaalvik, 2017) causing them to feel stressed and, in many cases, burned out (García-Arroyo, Osca Segovia & Peiró, 2019). Increasing job demands and lack of support leaves teachers with poor work-life balance, unprepared and untrained to fulfil some of the newly emerging responsibilities. For example, according to the World Teachers Day 2019 Fact Sheet (2019), in six European countries, 52% of teachers felt they received insufficient support in working with diversity and in Germany, most teachers felt not prepared to address the needs of refugee children. Based on the Teaching and Learning International Survey 2018 (OECD, 2020), there are also several administrative tasks and responsibilities that teachers spend their time on apart from their normal teaching and lesson planning hours which then cause a great amount of stress as teachers often find themselves under a great amount of time pressure because of it.

Time pressure, increased levels of stress and poor work-life balance often lead to chronic stress, emotional exhaustion (Rajendran, Watt & Richardson, 2020) and, if not addressed and prevented, also burnout (Skaalvik & Skaalvik, 2017). In the 11th Revision of the International Classification of Diseases (ICD-11), the World Health Organisation (WHO) defines burnout syndrome as "chronic workplace stress that has not been successfully managed. It is characterized by three dimensions: (1) feelings of energy depletion or exhaustion; (2) increased mental distance from one's job, or feelings of negativism or cynicism related to one's job; and (3) reduced professional efficacy." (ICD-11). Especially reduced professional efficacy and little energy can create a boundary hard to overcome. Many teachers do not recognise their signs of burnout early enough, sometimes their students perceive the signs of burnout before the teachers themselves do (Evers, Tomic & Brouwers, 2004). Or they do not feel supported enough to take appropriate actions (Hughes, 2001). All in all, it causes lower professional commitment, high turnover, increased redundancy (Easthope & Easthope, 2000) and most importantly reduced mental health and well-being in teachers.

Madigan and Kim (2021) in their recent systematic literature review on the relationship between teachers' burnout and its effect on students, found that students' academic performance and the quality of motivation to learn are being most affected when taught by a teacher experiencing burnout (Madigan & Kim, 2021; Shen et al., 2015). With reduced motivation, it becomes more difficult for the teachers to maintain a good classroom management which further increases the risk of burnout (Aloe et al., 2014).

On the other hand, many factors preventing or helping teachers from burnout have been found in research. For example, good teacher-student relationships (Aloe, Amo & Shanahan, 2014; Spilt, Koomen & Thijs, 2011), emotional intelligence (Puertas Molero et al., 2019; Fiorilli et al., 2019), autonomy and work-life balance (Johari, Tan & Zulkarnain, 2018), self-efficacy (Schwarzer & Hallum, 2008), frequent use of positive coping strategies (Smetackova et al., 2019) and workplace social support (Leiter, Bakker & Maslach, 2014) help teachers to cope better with stress. Also, the study of Deer (2020) investigated the effects of workplace-related positive activities for teachers and found a significant increase in teachers' engagement.

There have been many interventions for teachers aiming at reducing and preventing burnout. A meta-analysis investigating the effectiveness of such interventions, written by Iancu et al. (2018), revealed positive effects on reducing the factors of burnout. Most often, the interventions were helping teachers to reduce the overall levels of emotional exhaustion and increased the feelings of personal accomplishment. Cognitive behavioural therapy based interventions were found to be very effective for reducing emotional exhaustion and social support-based interventions had a positive significant effect on personal accomplishment. However, there was no significant effect for depersonalisation apart from mindfulness-based interventions (MBIs). Interestingly, MBIs were found to be the most effective as there was some improvement in all three factors of burnout. The MBIs had a significant positive effect on exhaustion and personal accomplishment and there was also a small effect on depersonalisation. This small effect, however, did not reach full significance due to a small number of studies.

1.2. The benefits of mindfulness-based interventions

There is a growing number of research papers suggesting that MBIs are very promising in terms of combating burnout and promoting teachers' well-being (Vonderlin et al., 2020; Klingbeil & Renshaw, 2018; Emerson et al., 2017; Zarate, Maggin & Passmore, 2019). Hwang et al. (2017) in their systematic review on mindfulness interventions for in-service teachers (preschool, primary, secondary, high school teachers) analysed quantitative and qualitative studies and found confirmatory positive outcomes of MBIs reducing teachers' levels of stress and burnout and enhancing their psychological health. Specifically, in qualitative studies, the teachers reported that practising mindfulness helped them to cope strategically with stress. They were able to develop a better awareness of their habitual reactions to stressful situations and felt enabled to respond in skilful, reflective ways, which decreased their perceived levels of stress. The study of Mackenzie et al. (2020) found a positive outcome in improving social-emotional competence in teachers, establishing a better classroom management. Skinner and Beers (2016) found that MBIs create a pathway to better resilience through increasing personal resources of teachers to cope with stress.

Moreover, students themselves may also benefit from their teachers receiving an MBI. As it was described in the study of Hwang et al. (2019), the students' sense of connectedness to teachers increases without the students undergoing any intervention. If the teachers' well-being and psychological health is well established, it helps students with increasing also their quality of well-being (Emerson et al., 2017), improving social and academic development (Lavy & Berkovich-Ohana, 2020). Specifically, in the study of Meiklejohn et al. (2012), there have been improvements in working memory, attention, academic skills, social skills, emotional regulation, and self-esteem, as well as self-reported improvements in mood and decreases in anxiety, stress, and fatigue in students.

The effectiveness of MBIs seems promising both for teachers and for students. However, there have been few studies suggesting that some variables can influence the effectivity of MBIs, such as the amount of time participants spent practicing mindfulness outside of formal sessions, and participants' fluency with mindfulness skills prior to beginning the intervention (Davidson & Kaszniak, 2015). In the qualitative study of Wigelsworth and Quinn (2020), the authors explored the teachers' perceptions of MBIs implementation. They found that teachers often do not have a collective understanding of

mindfulness, which creates a barrier to successful implementation of the intervention. If teachers, parents, or students perceive mindfulness as conflicting with their religion or do not understand the process and the likely outcomes, this may affect receptiveness to the intervention and decrease the motivation to engage in the intervention long term.

Also, time constraints are another important barrier to implementation. In the research of Joyce et al., (2010), the teachers reported they struggled to perceive how schools would schedule MBIs into their already strained time schedule. According to Wigelsworth and Quinn (2020), other logistical difficulties are personal space and training requirements. Some of the trainings take up to 8 or 10 weeks (e.g., Kabat-Zinn, 1990) and require a lot of extra personal time for mindfulness practise. Therefore, it would be better if MBIs are scheduled into the school curriculum so it would not become another burden on already stressed teachers.

Furthermore, the teachers need to be better informed and equipped with a working understanding that will facilitate the adoption of an MBI. The teachers themselves stated they would prefer more structured, manualised interventions that could be adapted as they became more familiar with the practice (Wigelsworth & Quinn, 2020). In the comprehensive analysis for mental health in schools by Carsley, Khoury and Heath (2018), the authors found that the follow up effects of MBIs were more significant when the teachers themselves practised mindfulness together with their students rather than having an external facilitator to deliver the MBI. One way of delivering an MBI in a way that might promote teachers' self-efficacy, could be smartphone-based mindfulness apps (Economides et al., 2018).

The study of James (2016) explored the effectiveness of a brief mobile phone – based mindfulness intervention for teachers and found that the teachers had significant positive changes in coping with stress. Specifically, those that used the mindfulness app had increases in self-reported trait mindfulness and declines in stress and emotion regulatory difficulties. Also, the study of Economides et al. (2018) found improvements in stress, affect and irritability following a brief use of a mindfulness smartphone app, and the authors in their article stated that smartphone apps are an effective medium for delivering a mindfulness training. Zarate, Maggin and Passmore (2019) in their meta-analysis on mindfulness training and teachers' well-being stressed that teachers who are experiencing the symptoms of burnout, anxiety or stress should consider implementing mindfulness practises daily or

weekly and they further recommend phone-based applications as a cost-effective method for decreasing the incidence of teacher burnout and rates of attrition.

1.3. The efficacy of smartphone-based mindfulness interventions

Scientific research on the mindfulness-based smartphone delivered interventions is still quite limited. A study done by Robinson (2018) explored the effectiveness of a mindfulness-based mobile app as a well-being intervention for support workers to tackle their symptoms of burnout. They chose a longitudinal design and compared the outcomes between a treatment and a control group. The results showed that a mindfulness intervention delivered through a smartphone app can reduce burnout and the amount of perceived stress and it can increase positive affect, mindfulness, and resilience in community support workers. Walsh, Saab and Farb (2019) explored the effects of a mindfulness meditation app on subjective well-being of undergraduate students and found that using a smartphone app may provide immediate positive effects on mood and stress while also providing long term benefits.

In the meta-analysis of randomised controlled trials by Gál, Ștefan and Cristea (2020), the authors assessed the efficacy of mindfulness meditation apps in enhancing users' well-being and mental health related outcomes. They included 34 research papers from which most participants were students, medical patients or adults with anxiety or depression. There were no studies including teachers. Some studies included general population and employees. The results of these studies showed that app-delivered mindfulness meditation interventions have small to medium positive effects on reducing perceived stress and symptoms of anxiety or depression and that these effects are maintained also after the intervention, at the time of follow up period.

A pilot study by Wood et al. (2017) examining the usability, acceptability, and effectiveness of a resilience mobile app for mental health care professionals revealed significant effects for reducing burnout in participants. Also, the pilot study by Roy et al. (2020) suggested that physicians experience reduced anxiety and burnout after engaging in using an app-based mindfulness training programme, adding that app-based mindfulness interventions could be effective tools to reduce anxiety and burnout in its users.

Drawing on to the presented findings of different studies reviewing or examining the effectiveness of app-based mindfulness interventions, it seems that the effects on reducing burnout are very promising. Although different mHealth apps might have different quality and the usability and effectivity might differ, it is a good start for more individual and long-lasting effects interventions which could help teachers and other professionals reduce burnout and help them to cope better with stress.

According to systematic review on usability evaluations of mobile mental health technologies by Inal et al. (2020), there is a need for developing better standardised usability questionnaires to ensure the quality of mHealth apps. Similarly, Bakker et al. (2016) stress the need for randomised control trials research to validate future mental health apps and the principles upon which they are designed. This means that there is still a lot of research to be done. Especially within the population of elementary school teachers (Brown, 2017). The efficacy of smartphone-based interventions has already shown some very promising results. According to Chandrashekar (2018), mobile apps have significant potential to deliver high-efficacy mental health interventions and transform the way how interventions are delivered and sustained. Also, the results of a study exploring mindfulness for perceived teacher stress and classroom climate by DiCarlo, Meaux and LaBiche (2020) suggested that low-cost, low labour-intensive interventions are effective in improving classroom conditions for both teachers and young children.

1.4. Current study

Based on the reviewed research articles, mindfulness interventions can be highly beneficial for decreasing burnout and have a great potential for improving teachers and also students' well-being. Zarate, Maggin and Passmore (2019) in their meta-analysis of mindfulness training on teachers' well-being recommended that "*it would be beneficial for schools to consider purchasing mindfulness apps for their educators as part of their wellness initiative or begin using these tools as part of professional development days. The culture of burnout acceptance needs to stop being the norm within our educational system and promoting wellness through practices such as mindfulness can and should become commonplace for educators in all settings.*"

The aim of the current study is therefore to explore the levels of functioning in the areas of burnout, work engagement, mindfulness and well-being after use of a mindfulness app-based intervention for elementary school teachers called the *Super Chill Mindfulness app* and to further evaluate the feasibility, preliminary efficacy and benefits of the app-based approach.

The following research questions were created to explore the levels of functioning after use of the app:

- *Will using the Super Chill Mindfulness app affect the teachers´ level of burnout?*
- *Will using the Super Chill Mindfulness app affect the teachers´ level of work engagement?*
- *Will using the Super Chill Mindfulness app affect the teachers´ level of mindfulness?*
- *Will using the Super Chill Mindfulness app affect the teachers´ level of well-being?*

To explore the feasibility, preliminary efficacy and benefits of the use of the *Super Chill Mindfulness app*, the following hypotheses were proposed and research questions created:

Based on the literature, the following hypotheses are proposed:

- H1: Burnout will lower or diminish during the use of the *Super Chill Mindfulness app*.
- H2: Mindfulness will increase during the use of the *Super Chill Mindfulness app.*
- H3: Well-being will increase during the use of the *Super Chill Mindfulness app*.
- H4: There will be a negative correlation between burnout and mindfulness scores.

Further research questions were created to explore the usefulness of the app:

- *Will teachers find the Super Chill Mindfulness app useful and easy to use?*
- *Will teachers engage in using the Super Chill Mindfulness app?*
- *Will using the Super Chill Mindfulness app help teachers to improve their classroom management?*
- *Do teachers have enough time and support to use the Super Chill Mindfulness app?*
- *What needs to be improved?*

2. Method

2.1. Design

The design of this study is explorative in nature. More specifically, a mixed method, cross-sectional design was adopted for the purpose of gaining a better understanding of the levels of functioning after using the *Super Chill Mindfulness app* for teachers and the feasibility and preliminary efficacy of the app. The design consists of two distinct phases, first quantitative and second qualitative phase (Creswell, Plano Clark, Gutmann & Hanson, 2003).

To measure the levels of functioning and the feasibility of the app, we compared the outcomes from the surveys to normative data within the population of Dutch teachers to gain a preliminary understanding of the possible benefits.

The first phase of this study includes quantitative data collection and analysis of four different measures for burnout, mindfulness, and well-being. The second phase consists semi-structured interviews to elaborate on and explain the quantitative results obtained in the first phase and to further explore the levels of functioning, benefits and feasibility of the *Super Chill Mindfulness app* in detail. Figure 1. has been created to clarify the process of the current study.

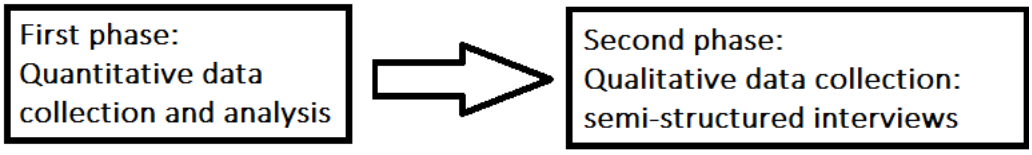


Figure 1. *Visual model of research design.*

2.2. Participants

At the beginning of the study, teachers from different elementary schools across the Netherlands were recruited by the Super Chill Foundation to take part in the *Super Chill Mindfulness app* pilot testing. During the pilot, the teachers filled out feedback forms in which they had the option to sign up to take part in this research study. In total, 53 teachers

agreed and signed up from which 22 (males = 3, females = 18, other = 1) completed the first quantitative phase. All participants took part voluntarily, based on their interest in the study.

The 22 participants were all teachers who ranged in age from 26 to 58 years (M_{age} = 43.63, SD = 9.76). From this sample, 3 participants (males = 1, females = 2) took part in the semi-structured interviews as part of the second qualitative phase.

All participants self-selected themselves as they were interested in the *Super Chill Mindfulness app* pilot and the research study. 20 out of 22 participants had a prior experience in mindfulness, yoga, or meditation before taking part in the pilot and 16 of them have been already practising longer than a year. They all came from different types of schools placed in small or big cities within the central and northern part of the Netherlands.

2.3. Materials

Both quantitative and qualitative measures were used.

2.3.1. Quantitative measures

Burnout in teachers

To measure burnout in the sample of teachers in the Netherlands, two different scales were used. The first scale was the Dutch version of the *Maslach Burnout Inventory for Educators,* called the ***Utrecht Burnout Scale for Teachers*** (UBOS-L; Schaufeli & Van Dierendonck, 2000; appendix 1). The scale has been developed specifically for the population of teachers and includes questions specific to the teacher environment. An example of such questions is: "*I feel exhilarated after working with my students"; "I don't really care what happens to some students"* or "*I can easily understand how my students feel about things"*.

The scale is a self-report measure which consists of 22 items in total and uses 7-point Likert scale (never – always) to measure how often the participants experience the symptoms of burnout within the school environment. The scale has three subscales which together define low, moderate, or high level of burnout. These are *Emotional exhaustion*, *Personal accomplishment*, and *Depersonalisation* subscale. The personal accomplishment subscale is

interpreted in the opposite direction as the emotional exhaustion and depersonalization subscales. High level of burnout is indicated by high emotional exhaustion, high depersonalization, and low personal accomplishment scores. On the other hand, low level of burnout is indicated by low emotional exhaustion, low depersonalization, and high personal accomplishment. To indicate low/moderate/high level of burnout the subscales are interpreted as follows: emotional exhaustion: ≤13, low; 14–23, moderate; ≥24 high. Depersonalization: ≤2, low; 3–8, moderate; ≥9, high. Accomplishment: ≥43, low; 36–42, moderate; ≤35 high.

The internal consistency for the main scale and its subscales was found sufficient, Cronbach's Alpha ranging between 0.72 and 0.90. UBOS-L is a widely used (Schaufeli et al., 2001; Tomic & Tomic, 2008) standardised assessment of burnout comparable to the original Maslach Burnout Inventory for teachers (Schaufeli & Van Dierendonck, 1993). It is a popular and reliable tool and its adaptation for teachers has been found a valid and reliable instrument which can be confidently used to measure burnout in this population (Kokkinos, 2006).

The second scale measured work engagement. It is assumed that work engagement is the opposite of burnout as those engaged with work are less likely to experience burnout as they usually see themselves as able to deal well with demands of their job. On the other hand, low engagement at work might be one of the signs indicating the risk of burn out (Schaufeli & Salanova, 2008). The 9-item ***Utrecht Work Engagement Scale*** (Schaufeli & Bakker, 2003; appendix 2) was chosen as it has been found as a reliable instrument (Balducci, Fraccaroli & Schaufeli, 2010), with Cronbach's alphas ranging between 0.89 to 0.97. The scale uses a 7-point Likert scale (never – always), on which participants are supposed to indicate how often the individual statements in the scale apply to them. It has three subscales measuring vigor, dedication and absorption.

Vigor is characterised by high levels of energy and mental resilience. The example statements for this subscale are" *"When I get up in the morning, I feel like going to work" and "At my work I always persevere, even when things do not go well."* The second subscale is called dedication and it refers to a sense of significance from one´s work, feeling enthusiastic, inspired and challenged by the work demands. The example statements are: "*I am enthusiastic about my job" and "I find the work that I do full of meaning and purpose."* The third subscale, absorption, refers to being totally and happily immersed in one´s work,

experiencing moments of flow. The example statements of this scale are: "*I feel happy when I am working intensely"* and *"Time flies when I am working."*

Mindfulness

A short form of the ***Five Facets Mindfulness Questionnaire*** (Bohlmeijer et al., 2011; appendix 3) was chosen for measuring mindfulness traits in teachers. This scale consists of 24 statements which participants rate on a 5-point Likert scale, according to how often they find the statements true for them in general (never – very often). The statements attempt to measure five different facets of mindfulness which are: *Observing, Describing, Acting with awareness*, *Non-judgement of inner experience* and *Non-reactivity to inner experience*. Facet scores range from 5 to 25 (except for observing, which ranges from 4 to 20), with higher scores indicating greater mindfulness. The reliability of this scale was found to be very good (Veehof et al., 2011), with Cronbach's alphas ranging from 0.69 to 0.90. The examples of the statements are: *"I watch my feelings without getting carried away by them", "Even when I'm feeling terribly upset, I can find a way to put it into words"* or *"I do jobs or tasks automatically without being aware of what I'm doing".*

Well-being

To measure well-being in teachers, the ***Mental Health Continuum – Short Form*** (Keyes, 2002; appendix 4) was chosen based on its good reliability and internal validity scores (Lamers et al., 2011) with Cronbach's alpha ranging from 0.74 to 0.89. The scale has three subscales measuring three dimensions of well-being: emotional, social, and psychological. There are 14 items in total and the participants are supposed to choose the answer that best represents how often they have experienced or felt a particular feeling on a 6-point Likert scale (never – every day). Here are example statements for the three different dimensions of well-being: emotional – *"During the past month, how often did you feel interested in life?"*; social – "*During the past month, how often did you feel that our society is a good place, or is becoming a better place, for all people?"* and psychological – "*During the past month, how often did you feel that your life has a sense of direction or meaning to it?"* or "*During the past month, how often did you feel that you had experiences that challenged you to grow and become a better person?".*

There were also questions about usability and other benefits of the *Super Chill Mindfulness app*. The usability and other benefits questions were 9 in total, all derived from different research papers. To get a better overview of how skilled the participants might have already been with practising mindfulness, there were 3 extra questions, asking participants to indicate their level of experience with mindfulness prior to the intervention. These questions are all presented in Appendix 8.

2.3.2. Qualitative measures

Semi-structured interviews

In order to gather some qualitative data for this research, a basic structure for semi-structured interviews was created, and participants were asked to allow 30 to 45 minutes of their time to spend on talking about their levels of functioning after use of the *Super Chill Mindfulness app* and the feasibility of the app. The reason for including a qualitative measure (appendix 5) was to get a better insight and understanding of the quantitative data and to gain an overview of participant's levels of functioning in terms of burnout, mindfulness traits, engagement, and well-being. The questions in the semi-structured interview were formed in the way to encourage participants to talk about all the areas measured by the four quantitative questionnaires and to discuss the usability and other possible benefits of the app.

The participants were aware of my status of a university student who is interested in mindfulness in education. The participants communicated via an online conferencing tool called Google Meet where they gave an additional verbal consent to the original full signed consent form that they provided at the start of the quantitative phase, to take part in the interview and also to have the whole conversation recorded for research purposes.

2.3.3. Intervention

To describe the *Super Chill Mindfulness app,* it consists of different guided mindfulness exercises. The exercises were created specifically for teachers and their school settings. There is a section with exercises designed for teachers' personal use and also other exercises designed to be delivered to the whole classroom to teachers and students could

practise together. The exercises were designed as short movies that showed a teacher and two or three pupils going through an exercise, such as jumping, sitting in silence, self-hugging, etc. The movies could be shown on a digiboard (electronic classroom blackboard) which made it easier for the teacher and the students to follow the guidance in the exercise. The app was freely available to all teachers who took part in the 4 - weeks pilot intervention and they could continue using the app also after the pilot was finished.

2.4. Procedure

2.4.1. First quantitative phase

After receiving ethical approval (appendix 6) for this study, teachers in elementary education across the Netherlands who took part in the *Super Chill Mindfulness app* intervention project, coordinated by the *Super Chill Foundation*, were asked to take part in this research study. They were first contacted by the *Super Chill Foundation* after finishing their 4 - weeks intervention and were asked to fill out a feedback form through which they were offered the option to take part in this research.

Those teachers who signed up were contacted via the University of Twente student email in which they received a consent form (appendix 7) with full description of this research project, including the research aims, the contact details of the researchers and the supervisor and they were explained the confidentiality and anonymity of participation. In the email, the participants could also find a link to the quantitative survey which they were asked to fill out.

The survey for this study was created in Qualtrics and its predicted duration was 25.3 minutes. There were 89 questions in total. In the Qualtrics expert review, the display logic of the questions was valid, and the questions were clear and concise, promising a good flow of the survey. Apart from the mentioned quantitative questionnaires, the survey also consisted of questionnaires for a different study. These were questionnaires on teacher self-efficacy (TSES; Tschannen-Moran & Hoy, 2001) and emotion regulation (ERQ; Gross & John, 2003).

Most of the participants filled out the Qualtrics survey within one month after the intervention. The data from the survey were analysed. The quantitative analysis was done in SPSS statistics software. T-tests, Pearson´s correlations were performed to compare the

quantitative results of participants within this study with normative data. The results were further explored during the second qualitative phase of this research.

2.4.2. Second qualitative phase

In the beginning of the quantitative survey, the participants were asked to indicate whether they would like to take part in the semi-structured interviews, and if yes, they were asked to provide their contact details. Those who expressed interest then received an email including more information about the interviews in a consent form (appendix 9). The language of the consent forms and the interviews was English as the researcher was not fluent in Dutch and there were not enough resources for having an interpreter. The participants received this information prior to the interview and expressed that their understanding and speaking fluency in English is sufficient.

The interviews took place in three months after the *Super Chill Mindfulness app* intervention. The participants connected online, via a video call, using Google Meet. The interviews lasted for about 30 to 45 minutes and were recorded after receiving a full verbal consent from the participants. The recordings were then transcribed, analysed and the emerged thematic categories were organised into a thematic network via ATLAS.ti 8.

3. Results

The aim of the current study was to explore the levels of functioning in the areas of burnout, work engagement, mindfulness and well-being after use of a mindfulness app-based intervention and to further evaluate the feasibility, preliminary efficacy and benefits of the app-based approach. These areas were analysed within the quantitative phase of this study and further explored in the qualitative part of this study.

It was hypothesised that burnout will lower or diminish during taking part in the *Super Chill Mindfulness app* intervention and the level of mindfulness and well-being will increase during taking part in the intervention. Also, it was hypothesised that there will be a negative correlation between the scores of burnout and mindfulness.

Pearson's correlations, independent samples t-tests and Dutch normative data were used for comparisons in this data analysis. Means (M), standard deviations (SD), interpreted outcomes of the questionnaires and Pearson's correlations are presented in following sections. A significance level of .05 was set for all tables in quantitative result section.

3.1. Quantitative phase

3.1.1. H1: Burnout will lower or diminish during the use of the *Super Chill Mindfulness app*.

The average subscale score for emotional exhaustion was 20.32 (SD = 6.36) which is considered moderate. Within the sample, 18.2% participants had scored for low emotional exhaustion, 54.4% of participants for moderate and 27.3% participants scored for high level of emotional exhaustion. The average subscale score for personal accomplishment was 25.32 (SD = 3.96). 95.5% participants scored low in this subscale, and only 1 participant (4.5%) scored moderate. The average subscale score for depersonalisation was 7.73 (SD = 1.83) and the scores were 72.7% and 27.3 % in the ranges of moderate, high, respectively.

Overall, from the sample of 22 participants, no participants met all three criteria for low level of burnout (low emotional exhaustion, low depersonalisation, and high personal accomplishment). There was one participant who met all three criteria for high level of burnout (high emotional exhaustion, high depersonalisation, and low personal

accomplishment), and most of the participants (95.5%) belonged to the moderate overall burnout category. The results are presented in Table 1.

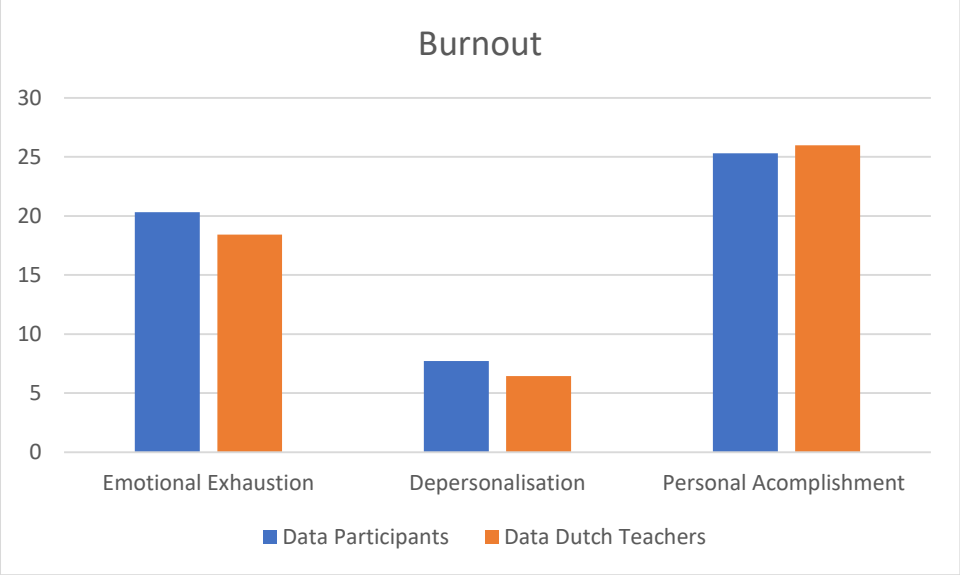
Table 1: Burnout syndrome within the teacher participant sample

Domain	N	Mean	SD	Low n (%)	Moderate n (%)	High n (%)
Emotional Exhaustion	22	20.32	6.36	18.2	54.4	27.3
Depersonalisation	22	7.73	1.83	0	72.7	27.3
Personal Accomplishment	22	25.32	3.96	95.5	4.5	0
Overall Burnout	22			0	95.5	4.5

Notes: to indicate low/moderate/high level of burnout the subscales are interpreted as follows: emotional exhaustion: ≤13, low; 14–23, moderate; ≥24 high. Depersonalization: ≤2, low; 3–8, moderate; ≥9, high. Accomplishment: ≥43, low; 36–42, moderate; ≤35 high.

To compare the level of burnout of the participants with the normative data for general Dutch population of teachers, Figure 2 was created to represent these differences. T-tests were performed and found non-significant for all three burnout subscales.

Figure 2: Comparison of the burnout data between participants' and Dutch normative data



Notes: Data Dutch Teachers taken from: Evers, Brouwers and Tomic (2002)

In terms of work engagement, the *Utrecht Work Engagement Scale* was used to measure overall engagement, vigor, dedication and absorption. The mean scores for all three

subscales in work engagement indicated high levels of work engagement. Total mean score 4,74 (SD = 0,83) confirmed this notion. The results are presented in Table 2.

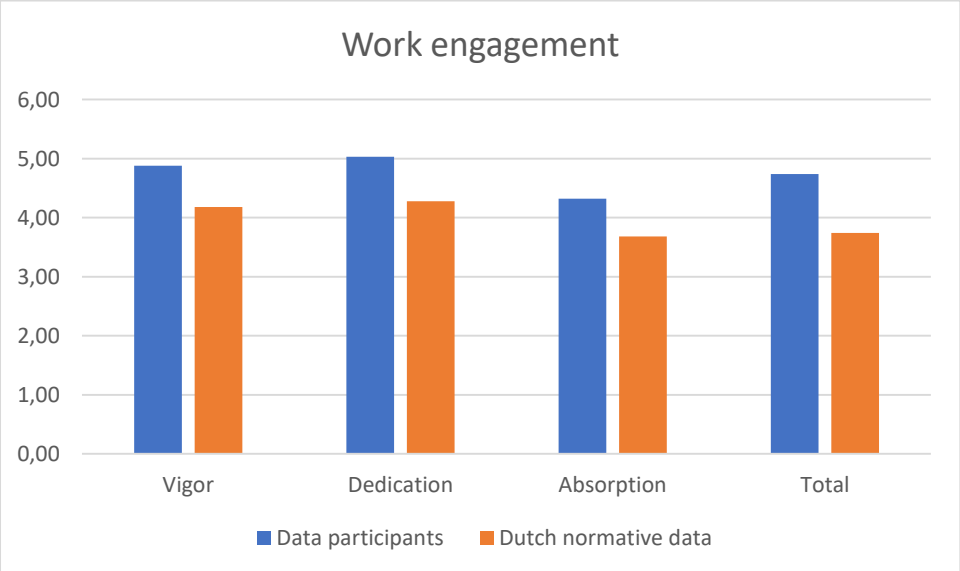
Table 2: Work engagement of participants compared with Dutch normative data

Data Participants	N	Mean	SD	Dutch normative data	N	Mean	SD	t	df	p
Vigor	22	4.88	0.75	Vigor	9,679	4.18	1.24	2.65	9699	0.008
Dedication	22	5.03	1.26	Dedication	9,679	4.28	1.36	2.58	9699	0.010
Absorption	22	4.32	1.05	Absorption	9,679	3.68	1.43	2.10	9699	0.036
Total	22	4.74	0.83	Total	9,679.00	3.74	1.17	4.01	9699	0.000

Notes: Dutch normative data taken from: Schaufeli and Bakker (2003); SD = Standard Deviation; p-value = two tailed; To indicate the level of work engagement, the subscales and total scores are interpreted as follows: Vigor ≤ 2.00 low; 2,01 – 3,25 low; 3,26 – 4,80 average; 4,81 – 5,65 high; ≥ 5,66 very high; Dedication ≤ 1,33 very low; 1,34 – 2,90 low; 2,91 – 4,70 average; 4,71 – 5,69 high; ≥ 5,70 very high; Absorption ≤ 1,17 very low; 1,18 – 2,33 low; 2,34 – 4,20 average; 4,21 – 5,33 high; ≥ 5,34 very high; total score ≤ 1,77 very low; 1,78 – 2,88 low; 2,89 – 4,66 average; 4,67 – 5,50 high; ≥ 5,51 very high

To compare the outcomes of the work engagement questionnaire, the normative data from Dutch sample of 9 679 participants were used and t-tests were performed (see Table 2). The Dutch normative data for total work engagement and all three subscales reached only average levels of work engagement. In comparison, participants´ of this study reached high work engagement levels in total and in all three subscales. The performed t-tests revealed significant differences in all three subscales scores and also in the total score t (22) = 4.01, p = .000062. The data are compared in Figure 3.

Figure 3: Comparison of the work engagement normative and participants´ data



3.1.2. H2: Mindfulness will increase during the use of the *Super Chill Mindfulness app*.

The level of mindfulness in participants was measured by the *Five Facets Mindfulness Questionnaire – Short Form*. The five explored facets of mindfulness are observing, describing, acting with awareness, non-judging, and non-responding. The mean scores together with the total score for mindfulness are presented in Table 3.

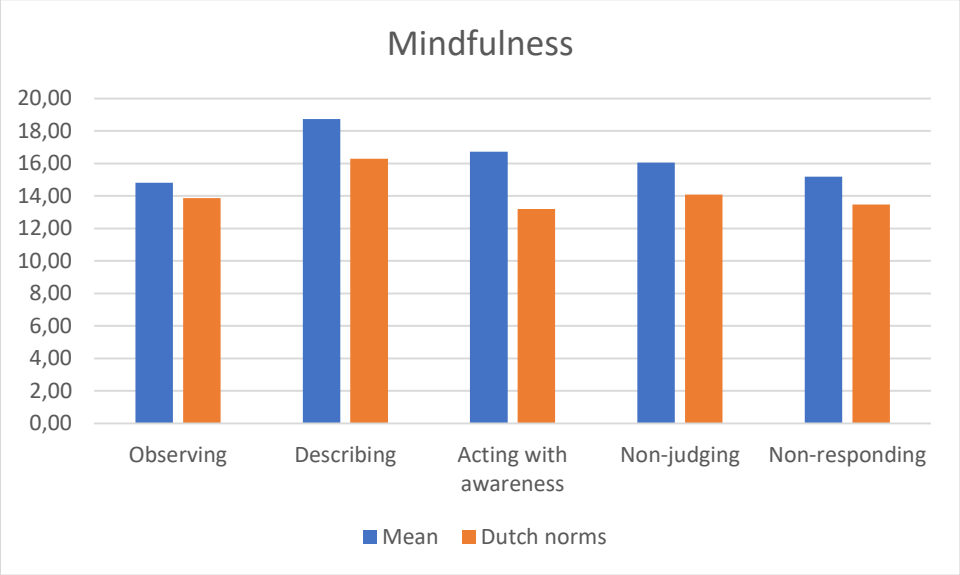
Table 3: Facets of the FFMQ – SF questionnaire on mindfulness

Domain	N	Mean	SD	Dutch norms	SD	t	df	p
Observing	22	14.82	3.76	13.86	3.21	1.24	124	0.219
Describing	22	18.73	3.30	16.28	3.91	2.74	124	0.007
Acting with awareness	22	16.73	2.10	13.19	3.32	4.79	124	0.000
Non-judging	22	16.05	3.48	14.09	3.63	2.32	124	0.022
Non-responding	22	15.18	3.05	13.47	3.07	2.38	124	0.019
Total	22	81.50	8.98					

Notes: FFMQ – SF = Five Facets Mindfulness Questionnaire – Short Form, p-value = two tailed

The results were compared to the general Dutch normative data for mindfulness in general population (Bohlmeijer et al., 2011). The comparison revealed higher mindfulness scores within the sample of participants of this study than in the normative data, in all five facets. The performed t-tests revealed significant differences in all facets except Observing t (22) = 1.24, p = 0.219. Describing t (22) = 2.74, p = .007; Acting with awareness t (22) = 4.79, p = .000005; Non-judging t (22) = 2.32, p = .022 and Non-responding t (22) = 2.38, p = .019. The results are presented in Figure 4.

Figure 4: Comparison of the mindfulness data between participants' and Dutch normative data



Notes: Mean = the mean scores for the participant sample of this study

3.1.3. H3: Well-being will increase during the use of the *Super Chill Mindfulness app*.

Emotional and social well-being was measured by the Mental Health Continuum – Short Form. On average, the participants had moderate scores of emotional and social well-being. The mean scores together with the Dutch normative data are presented in Table 4.

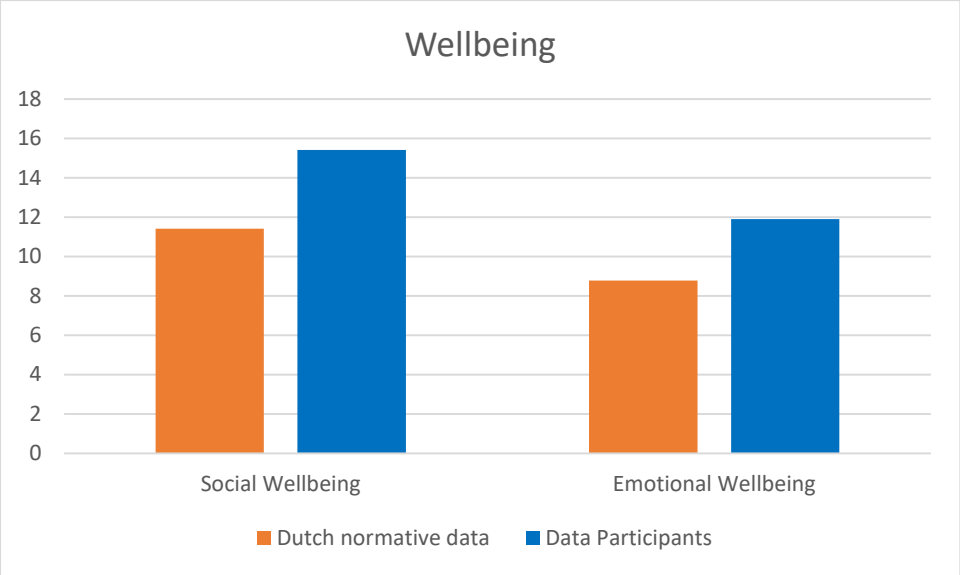
Table 4: Social and Emotional Well-being

Participants	N	Mean	SD	Dutch normative data	N	Mean	SD	t	df	p
Emotional Well-being	22	11.41	2.75	Emotional Well-being	133	8.78	2.26	4.90	153	0.000
Social Well-being	22	15.41	5.47	Social Well-being	133	11.89	3.26	4.20	153	0.000

Notes: p – value = two tailed

Compared to a normative sample of Dutch teachers (Ludden, Kelders & Snippert, 2014) with moderate levels of well-being, the participants in this study scored higher in both areas. Performed t-tests revealed significant differences in both presented areas of well-being. For emotional well-being t (22) = 4.90, p = .000002 and for social well-being t (22) = 4.20, p = .000046. The results are presented in Figure 5.

Figure 5: Emotional and Social Well-being compared to Dutch normative sample



3.1.4. H4: There will be a negative correlation between burnout and mindfulness scores.

It was hypothesised that higher mindfulness scores will result in lower levels of burnout between teachers. Specifically, emotional exhaustion and depersonalisation subscales will negatively correlate with mindfulness and personal accomplishment subscale will correlate positively with mindfulness. One - tailed Pearson´s correlation was performed to explore these interactions. The results are presented in Table 5.

Table 5: Pearson´s correlation between burnout and mindfulness

			Pearson´s correlation			
	M	**SD**	**1**	**2**	**3**	**4**
Mindfulness	81.50	8.98	-	- .010	- .353	.152
Emotional Exhaustion	20.32	6.36	- .010	-	-	-
Depersonalisation	7.73	1.83	- .353	-	-	-
Personal acomplishment	25.32	3.96	.152	-	-	-

Note: * Correlation is significant at the 0.01 level (1-tailed)

All correlations were found non-significant. However, there was a negative correlation between mindfulness and emotional exhaustion r (22) = - .010, p > .01; and

between mindfulness and depersonalisation r (22) = - .353, p > .01, which are in the expected direction. Also, there was a positive correlation between mindfulness and personal achievement r (22) = .152, p > .01.

To explore this correlation further, another one - tailed Person´s correlation between all five facets of mindfulness and burnout was performed. The results are presented in Table 6.

Table 6: Pearson´s correlation between five facets of mindfulness and burnout

			Pearson´s correlation		
	M	**SD**	Emotional Exhaustion	Depersonalisation	Personal Acomplishment
Observing	14.82	3.76	.419*	- .243	.407*
Describing	18.73	3.30	.016	- .234	.390*
Acting with Awareness	16.73	2.10	- .179	- .343	- .213
Non-judging	16.05	3.48	- .001	- .102	- .281
Non-responding	15.18	3.05	- .438*	- .136	- .009

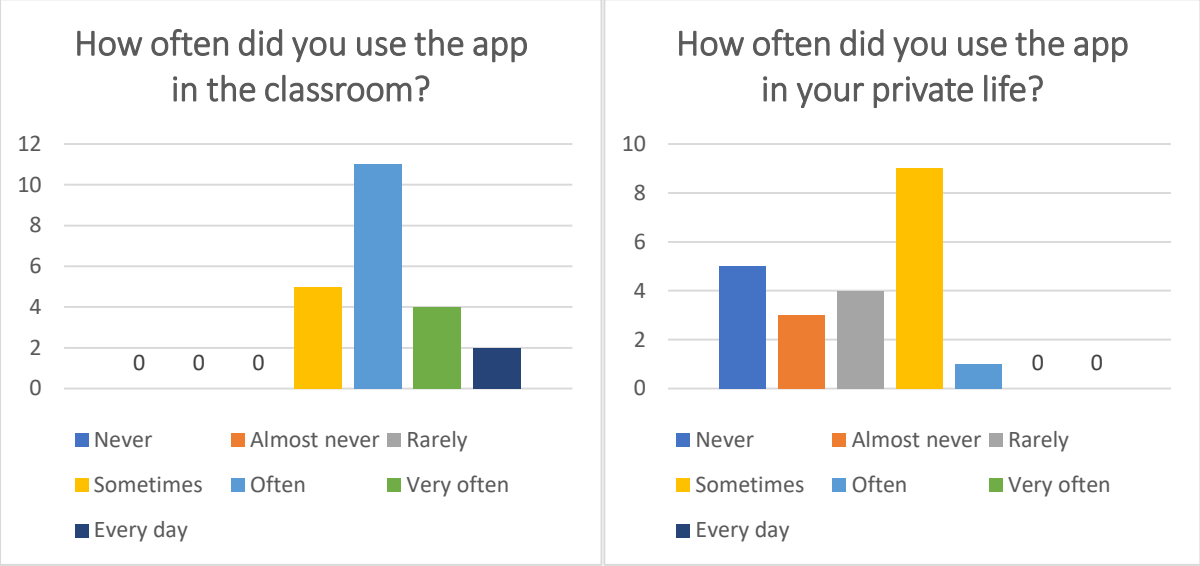
Note: * Correlation is significant at the 0.05 level (1-tailed)

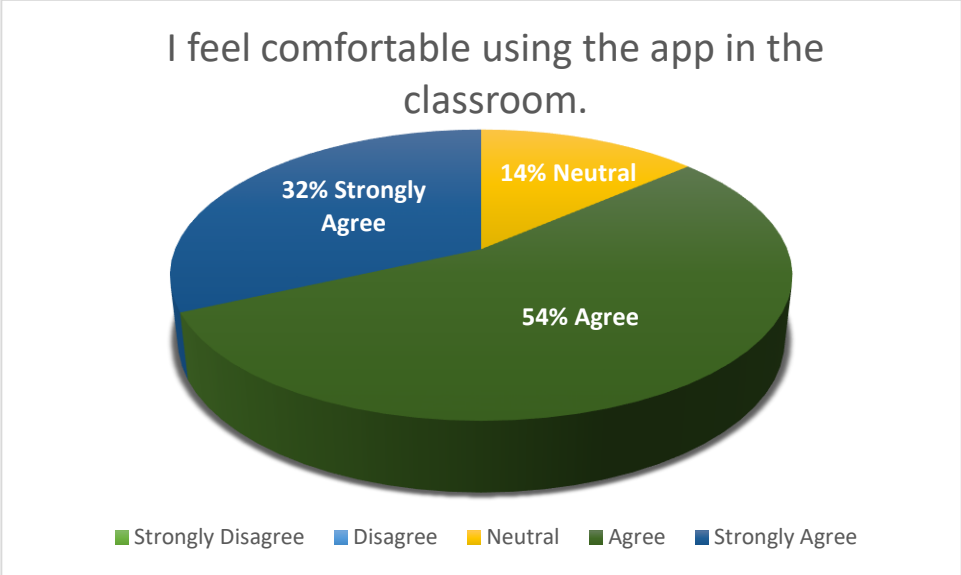
For emotional exhaustion, a one-tailed negative correlation between non-responding and emotional exhaustion was found significant r (22) = - .438, p < 0.05 and a positive correlation between observing and emotional exhaustion was found significant r (22) = .419, p < 0.05. For depersonalisation, all correlations with all five facets of mindfulness were found negative and non-significant. For personal accomplishment, two one-tailed positive correlations were found significant: a correlation between observing and personal accomplishment r (22) = .407, p < 0.05 and a correlation between describing and personal accomplishment r (22) = .390, p < 0.05.

3.1.5. Usability and other benefits of the *Super Chill Mindfulness app*

The results for usability and other benefits of using the *Super Chill Mindfulness App* are presented in the following Figures 6, 7, 8 and 9.

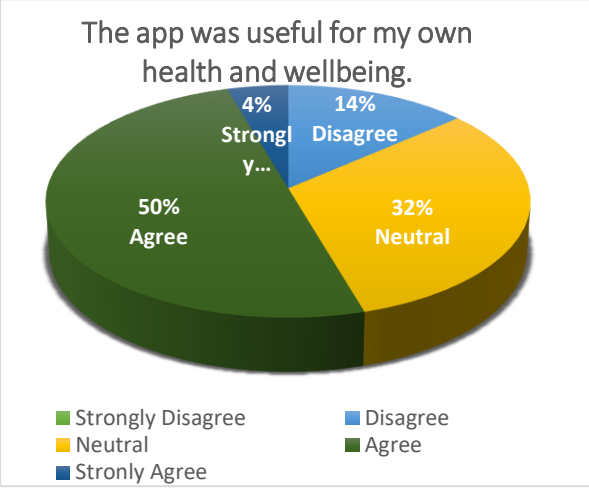
Figure 6: Usability of the *Super Chill Mindfulness App*

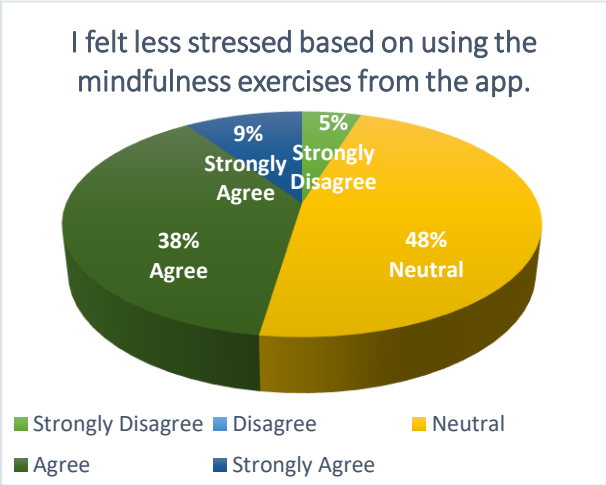




Based on the survey outcomes, the participants used the *Super Chill Mindfulness app* more often in their classroom than in their private life. 86% of participants agreed that they felt comfortable using the app in the classroom and they all used it either sometimes, often, very often or every day. In private life, 9 out of 22 participants used the app sometimes, the rest of them rarely, almost never or never.

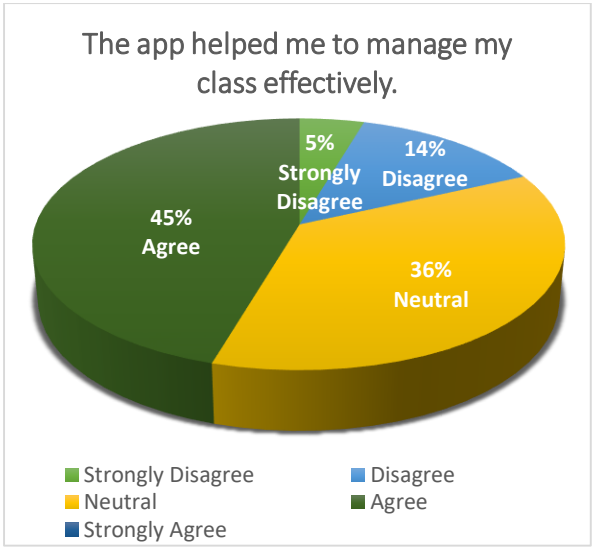
Figure 7: Stress levels and teachers' general well-being

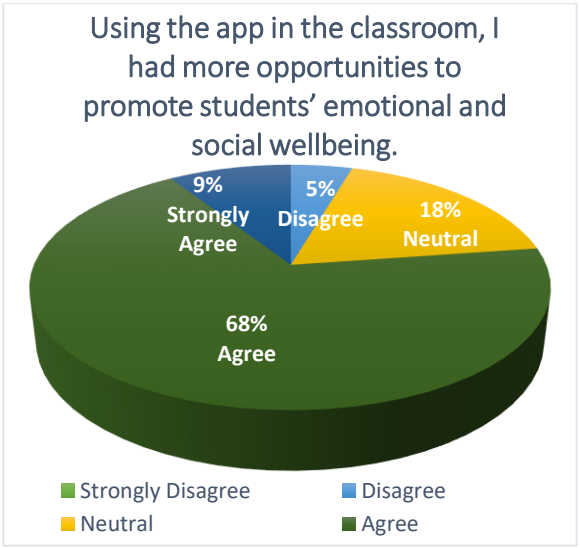




The reported changes in stress levels and well-being were positive for most participants. 54 % reported that the *Super Chill Mindfulness app* was useful for their health and well-being. The rest of the participants felt neutral, or they did not experience any changes. In terms of perceived stress, 47% of participants reported they felt less stressed based on using the mindfulness exercises from the app. The rest of them felt neutral and one participant felt the exercises did not make any difference.

Figure 8: Classroom management benefits

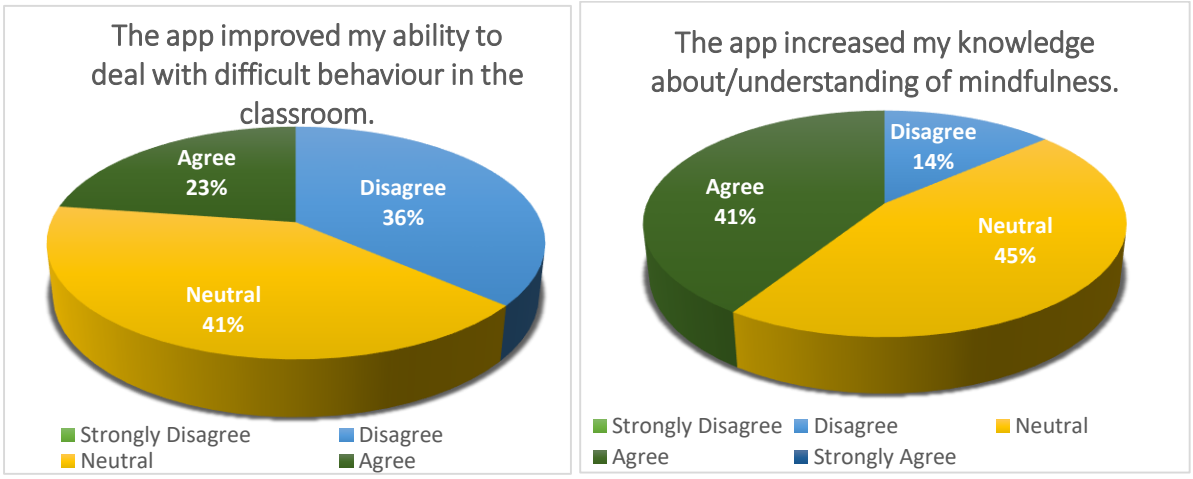




In terms of other benefits of using the *Super Chill Mindfulness app*, 77% of the participants reported that the app has helped them to have more opportunities to promote students´ emotional and social well-being. 45% agreed that the app helped them to manage

their class more effectively overall. The rest of the participants felt neutral and three of them did not find any improvements based on engaging with the app.

Figure 9: Teachers' knowledge and skills



In terms of skills and gained knowledge, 41% of participants felt that the app has helped them to get a better understanding of mindfulness; 14% disagreed and 45% of the participants felt neutral. Most of the participants felt neutral answering the question whether the app improved their ability to deal with difficult behaviour in the classroom. 36% of them thought the app did not have any influence and 23% felt the app helped them to manage their students´ difficult behaviour in a better way.

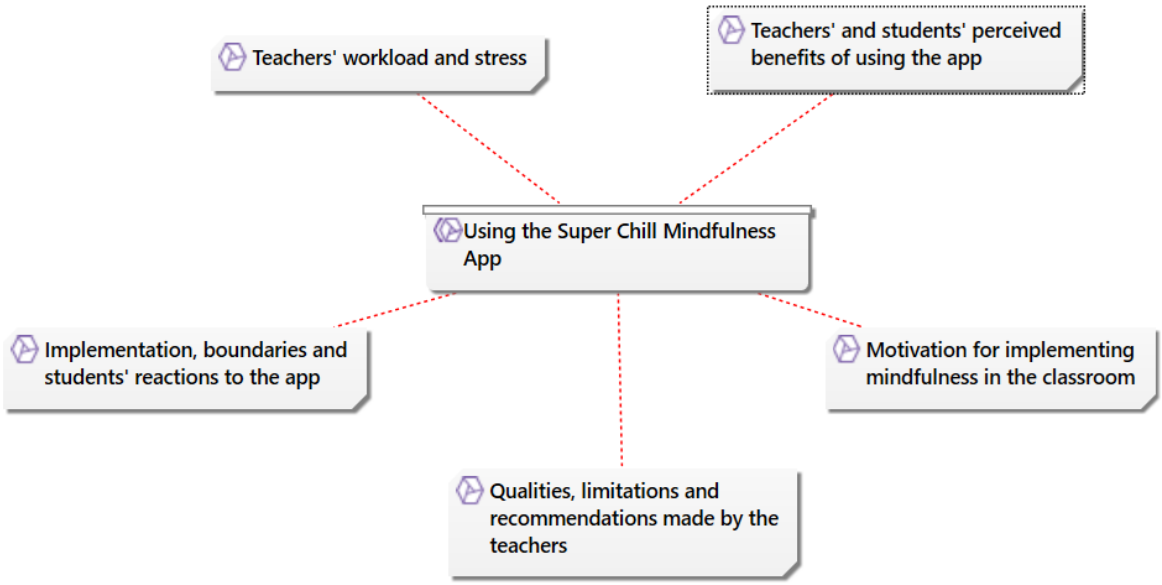
3.2. Qualitative

Semi-structured interviews were conducted to explore the perceived benefits of the *Super Chill Mindfulness app* and to further explain the outcomes from the quantitative phase. Thematic analysis was chosen as it was found the best method to identify the key themes within participants responses to the interviews (Alhojailan, 2012; Creswell, Hanson, Clark Plano & Morales, 2007). Data from three different participants were first transcribed, anonymised and organised into one coherent document. Then, the data were read and re-read several times in order for the researcher to become more familiar with the raw data (Bogdan & Biklen, 2007).

In the following stage, the data were analysed in ATLAS.ti 8. They were carefully examined, salient patterns were identified, and basic themes were labelled with code words

(Braun & Clarke, 2006). According to Huberman and Miles (1994), it is important to validate the emerged themes, especially at the early stages of analysis. Therefore, once coding was completed, the validity of basic themes was reviewed and desirable changes were made, as recommended by Alhojailan (2012). These themes and code words were then grouped into thematic categories and those were then organised into a thematic network (Attride-Stirling, 2001), which is presented in Figure 10.

Figure 10: Thematic network



In the thematic network, five different theme categories were found: *Teachers' and students' perceived benefits of using the app; Motivation for implementing mindfulness in the classroom; Implementation, boundaries, and students' reactions to the app; Qualities, limitations and recommendations made by the teachers; Teachers' workload and stress.* Each category has its own group of codes and those are presented below together with example quotes.

3.2.1. Teachers' and students' perceived benefits of using the app

In the category *Teachers' and students' perceived benefits of using the app*, there have been several benefits highlighting relaxation. Mindfulness helped the teachers to relax,

breathe, focus and establish a better classroom management and atmosphere within the class. Example quotes for this would be: *"By doing the mindfulness exercises, the distance between the teachers and the students become smaller."* and *"Having mandatory mindfulness exercises is nice to getting some relaxation within a busy day."*.

For students, the teachers thought that mindfulness helped them mostly with better concentration, feeling more relaxed, establishing safer environment and better behaviour towards each other. Example quotes for this would be: *"The students are more relaxed after doing mindfulness exercises with the app."; "Students stopped being nasty to each other, there were hardly any conflicts or bullying."; "Children can concentrate better after mindfulness sessions."* and *"Mindfulness benefits are better behaviour towards others, concentration during the day and reflection."*

All themes within this category are presented in Figure 11.

Figure 11: *Teachers' and students' perceived benefits of using the app*

3.2.2. Motivation for implementing mindfulness in the classroom

Next category is *Motivation for implementing mindfulness in the classroom.* There have been several themes, which especially highlighted the importance of establishing a relaxation practise for the students. The teachers felt that children do not have enough time to rest in a day as the curriculum is very full and the students have a lot of hobbies in the afternoon or spend a lot of time on their devices. Example quotes are: *"I think there is a lack of relaxing at school."* and *Children are constantly busy until they go to sleep.".* Some teachers have already tried some relaxation techniques in the classroom like listening to yoga music, massaging each other's hands, drawing, brain gym, etc. One of the teachers said: *"There are a lot of energizers but not many websites or practises for children to calm down, that makes the Super Chill Mindfulness app different from other things.".*

The need for mindfulness was a theme shared by all interviewed teachers. They all had an experience with practising mindfulness and thought it was an important skill to teach the children. For example, one of the teachers said: *"Mindfulness should be one of the 21st century skills."* and another teacher said: *"The society is getting busier and busier, there are more distractions for children and also for grownups, so I am hoping that mindfulness will be a more general thing to use in education in schools everywhere."*

The teachers were also very motivated to spread the word and introduce mindfulness to their schools during the *Super Chill Mindfulness app* pilot. Some teachers said: *"I like the Super Chill Mindfulness app because people are doing something different in the world about educating children."* and *"This was my motivation for the pilot to spread the word and let everybody see that mindfulness is a nice way of calming down."* Other teachers said regarding to the mindfulness practise that: *"I want to tell the children about the important stuff in life because they are from tough neighbourhoods."; "Diplomas are not important, life skills are."; "I am aware of the function of relaxing in class and I would like to do more of that."* and *"Because of my experience with mindfulness in the past, I decided to do it."*

An overview of all emerged themes is presented in Figure 12.

Figure 12: *Motivation for implementing mindfulness in the classroom*

3.2.3. Qualities, limitations and recommendations made by the teachers

Evaluation of the *Super Chill Mindfulness app* is included in the next thematic category *Qualities, limitations and recommendations made by the teachers.* Within this category, the teachers evaluated the usability of the app, commented on the qualities and limitations of the app and offered some recommendations and inside based on using the app during the pilot. All the teachers agreed that the app was efficient and easy to use. They liked that the guidance was easy to follow, it did not need much preparation to implement the mindfulness practise and there were exercises for calming down and also for energizing. Example quotes of this would be: *"The key to introducing something new in education is time, if the activity does not require preparation and extra time it is good, just put it on and*

that's it." and *"The app is still very easy to use for everyone also when you don't practise mindfulness yourself."*

One of the teachers also thought it was good to have an app instead of having someone external coming in and teaching mindfulness: *"Students can be a little bit more self-conscious if there would be a stranger teaching them mindfulness, when it is just a board and the app, it is more safe to deal with the exercises."* Other teachers thought it was important to be a role model for the students in terms of mindfulness practise. Few of them said: *"To be motivated to practise mindfulness with your children, you should practise also by yourself."; "Students feel more safe if the teacher joins them as well, the teacher is not better neither has a higher position."; "It is important that the teacher is confident in doing the mindfulness exercises."* and *"The key is to care about yourself as a teacher and let children to see it, you have to live it."*

In terms of the limitations and recommendations, the teachers reported that the images in the app were distracting the children, and that it took time to learn which exercise use when. The main recommendation was to create a manual or tips on the website for the teachers to know which exercise is good to use for energizing and which is better for calming down. In terms of delivering the app, one teacher thought it would be better to have an expert coming in and teaching mindfulness instead of the teacher. Another teacher said: *"The app could be useful, but it really depends on how the teachers will teach it.".* One teacher added: *"You have to do mindfulness in your personal life as well otherwise in the classroom it will become some kind of a trick."*

All main themes within this category are presented in Figure 13.

Figure 13: *Qualities, limitations and recommendations made by the teachers*

3.2.4. Implementation, boundaries, and students' reactions to the app

The next category highlights the process of implementing the *Super Chill Mindfulness app* in the classroom, the boundaries to practising mindfulness and the students' reaction and adaptation to the app. All the teachers used the *Super Chill Mindfulness app* with their students. Some of them once or twice a day, others once or twice a week. Some of the teachers followed the app all the way, some of them learnt how to do it and then led mindfulness sessions themselves. They said: *"It is important that the teacher is confident in doing the mindfulness exercises."*. For some teachers, it was important to include the time for mindfulness practise into the schedule: *"For me, it is better to put the Mindfulness Super Chill app in the schedule not to forget it."*

The boundaries to practising mindfulness were mostly limited or no awareness of mindfulness, not enough time, or confidence. Example quotes for this are: *"The other*

teachers made fun of me when I tried to introduce them mindfulness exercises."; "With mindfulness … a lot of people think about Eastern religions and there is a lot of negativity between Christians."; "The most important obstacle to introducing mindfulness in classroom is time."; "Not every teacher is confident enough to start." and *"The schedule is too full and teachers sometimes have to drop what they think is not important and mindfulness might be first."*

The reaction of the students to mindfulness exercises was mostly positive, although it took a bit of time to get used to it. The teachers said: *"The first couple of times the children were looking at me like I was crazy when I introduced them to mindfulness."* and *"At first, the children were laughing but then they kept asking for it."* One teacher said: *"If the students don't have a safe environment, they might laugh and make fun of the mindfulness exercises and won't take the exercises seriously because they don't feel safe."*

After the students got used to the mindfulness practise, they seemed to enjoy it: *"Most of the students were really enthusiastic and really wanted to engage with mindfulness every day or every week. But there are always one or two students for whom it is too hard to relax, and they keep making fun of it."; "Students especially enjoyed the breathing activities, and they also really liked the snowball activity."* and *"The children kept asking me, can we do it again?"*

The overview of all emerged themes within this category are presented in Figure 14.

Figure 14: *Implementation, boundaries, and students' reaction to the app*

3.2.5. *Teachers' workload and stress*

The last thematic category includes the emerged themes regarding teachers' overall well-being, the amount of stress and the general workload. The teachers reported they feel busy all the time. For example: *"In teaching job, you are never finished, there are always things to do at midnight, the work is never done."; "The main cause for my burnout was that I was too busy for a long time."; "A lot of teachers find it stressful getting everything done in a day because they have to meet all the rules for every course."* and *"During teaching you have to be in high energy levels, do this and that and the whole day is planned."*

One teacher felt there was no time for personal use of the mindfulness app: *"I wanted to try the app outside of my workplace, but I didn't find the time."* Some teachers also reported dissatisfaction with the educational system as it is set up. One of the teachers said: *"We are not telling the children what to do with their mental state."* Another teacher added: *"We don't teach things students really need in life."* Others felt that the students need more support in general: *"We have to have teachers who will believe in their students that they can achieve things and make an impact."* and *"When I was a child, I missed someone to tell me that I was already good enough."*

All emerged themes within this category are presented in Figure 15.

Figure 15: *Teachers' workload and stress*

In conclusion, there have been many themes highlighting teachers' workload, stress, and dissatisfaction with the educational system. Teachers said that: *"In teaching job, you are never finished, there are always things to do at midnight, the work is never done."*. One teacher in the sample has already experienced burn out and mentioned that: *"The main cause for my burnout was that I was too busy for a long time."*. Also, the moderate burnout

symptoms found within the quantitative phase in teachers were further explained. Teachers reported high work pace and stress, big overload, and lack of time for themselves. One teacher mentioned: *"I have started with a mindfulness app upon the recommendation from my psychologist when I was burned out and I liked it."*

There have been many themes highlighting the perceived benefits of using the *Super Chill Mindfulness app*. For example: *"By doing the mindfulness exercises, the distance between the teachers and the students become smaller."; "Having mandatory mindfulness exercises is nice to getting some relaxation within a busy day."; "The students are more relaxed after doing mindfulness exercises with the app."; "Students stopped being nasty to each other, there were hardly any conflicts or bullying."* or *"Children can concentrate better after mindfulness sessions."*. After using the app for four weeks in the classroom with the students, one of the teachers mentioned: *"There are a lot of energizers but not many websites or practises for children to calm down, that makes the Super Chill Mindfulness app different from other things."*.

Many teachers felt that the educational system still does not offer much space for relaxation and teaching general life skills: *"Diplomas are not important, life skills are."; "We are not telling the children what to do with their mental state."* or *"We don't teach things students really need in life."*. The teachers felt that: *"I think there is a lack of relaxing at school."* and they thought that mindfulness would be an effective solution: *"The society is getting busier and busier, there are more distractions for children and also for grownups, so I am hoping that mindfulness will be a more general thing to use in education in schools everywhere."*

However, the process of implementing mindfulness into schools and classrooms might not be easy. The teachers reported that: *"The other teachers made fun of me when I tried to introduce them mindfulness exercises."; "With mindfulness … a lot of people think about Eastern religions and there is a lot of negativity between Christians."*. Therefore, the lack of awareness and understanding of the benefits of mindfulness practise seems to mitigate the efforts of teachers in implementing mindfulness into their teaching. One teacher said: *"Not every teacher is confident enough to start."*. Many teachers stressed the importance for the teacher to be a role model regarding to mindfulness practise: *"To be motivated to practise mindfulness with your children, you should practise also by yourself."* or *"Students feel more*

safe if the teacher joins them as well, the teacher is not better neither has a higher position.". Another teacher explained: *"If the students don't have a safe environment, they might laugh and make fun of the mindfulness exercises and won't take the exercises seriously because they don't feel safe.*

One teacher said it would be good to schedule mindfulness or make it mandatory to prevent skipping this exercise due to lack of time or lack of understanding the benefits of mindfulness practise: *"The schedule is too full, and teachers sometimes have to drop what they think is not important and mindfulness might be first."; "For me, it is better to put the Mindfulness Super Chill app in the schedule not to forget it."* and *"The most important obstacle to introducing mindfulness in classroom is time."*.

Time seemed to be an advantage of the smartphone-based mindfulness intervention. The teachers said that: *"The key to introducing something new in education is time, if the activity does not require preparation and extra time it is good, just put it on and that's it."*. They appreciated the app was easy to use: *"The app is still very easy to use for everyone also when you don't practise mindfulness yourself."* and that there was no need for an external trainer coming in to the classroom: *"Students can be a little bit more self-conscious if there would be a stranger teaching them mindfulness, when it is just a board and the app, it is more safe to deal with the exercises."* because the teachers felt that *"The guidance was sufficient."*.

Further implications of the qualitative phase are discussed in the following section.

4. Discussion

This study explored the perceived benefits and levels of functioning in terms of burnout, mindfulness and wellbeing after using the *Super Chill Mindfulness app* intervention by teachers in elementary education and evaluated the feasibility of the app-based approach. The design for this study was mixed methods in nature. It was expected that after use of the app, the teachers will score lower on burnout and higher on mindfulness and wellbeing than comparison groups that did not use the app. The following research questions were created:

- *Will using the Super Chill Mindfulness app affect the teachers´ level of* burnout*?*
- *Will using the Super Chill Mindfulness app affect the teachers´ level of work engagement?*
- *Will using the Super Chill Mindfulness app affect the teachers´ level of mindfulness?*
- *Will using the Super Chill Mindfulness app affect the teachers´ level of well-being?*

The feasibility and preliminary efficacy of the app was also explored and the following hypothesis were created: H1: Burnout will lower or diminish after using the *Super Chill Mindfulness app* in teachers; H2: Mindfulness will increase during using the *Super Chill Mindfulness app* in teachers; H3: Wellbeing will increase during using the *Super Chill Mindfulness app* in teachers; H4: There will be a negative correlation between burnout and mindfulness scores. To explore the feasibility and usefulness of the app further, the following research questions were added:

- *Will teachers find the Super Chill Mindfulness app useful and easy to use?*
- *Will teachers engage in using the Super Chill Mindfulness app?*
- *Will using the Super Chill Mindfulness app help teachers to improve their classroom management?*
- *Do teachers have enough time and support to use the Super Chill Mindfulness app?*
- *What needs to be improved?*

Levels of functioning after using the *Super Chill Mindfulness app*

To start with the levels of functioning, the teachers scored higher in work engagement, mindfulness and wellbeing after using the *Super Chill Mindfulness app* than the comparison groups that did not use the app. However, the teachers did not score lower on

burnout which was originally expected. The reason for this could be explained by the qualitative phase outcomes as the teachers reported high work demands: *"In teaching job, you are never finished, there are always things to do at midnight, the work is never done."*. One teacher has already experienced burnout and said: *"The main cause for my burnout was that I was too busy for a long time."*. Also, some teachers reported high amount of stress: *"A lot of teachers find it stressful getting everything done in a day because they have to meet all the rules for every course."* and *"During teaching you have to be in high energy levels, do this and that and the whole day is planned."*. It seems then that although teachers scored higher in work engagement, mindfulness and wellbeing after using the *Super Chill Mindfulness app*, the burnout symptoms did not diminish due to high job demands. This could be explained by a conceptual review on job demands and burnout by Khan, Yusoff and Khan (2014) in which the authors mentioned the importance of autonomy for the teachers, social support and feedback to enable them to use their resources effectively so the symptoms of burnout would consequently lower.

Social support and feedback was not provided to the teachers, according to the outcomes of the qualitative phase. Teachers reported quite the opposite, they felt not accepted with their new resource, the *Super Chill Mindfulness app*. One teacher reported: *"The other teachers made fun of me when I tried to introduce them mindfulness exercises."* According to Wigelsworth and Quinn (2020), teachers often do not have a collective understanding of mindfulness and that creates a barrier to successful implementation of the intervention. This was also visible in the themes which emerged from the semi-structured interviews in this research as the teachers reported: *"With mindfulness … a lot of people think about Eastern religions and there is a lot of negativity between Christians."*. Therefore, it seems that for a successful future implementation of mindfulness interventions in education, raising awareness of mindfulness and its benefits is crucial and it should become the first step in implementing these practises.

Feasibility of the app

In terms of feasibility of the app, several hypotheses were included. There were no significant results for lowering or diminishing burnout in teachers. This hypothesis therefore did not confirm. However, there were significant differences between levels of mindfulness, well-being and work engagement comparing participants' and normative data. The

hypothesis about increasing mindfulness and wellbeing during using the mindfulness-based app intervention were confirmed. Work engagement was also significantly higher in comparison to the comparison group that did not use the intervention. This suggests, that although teachers did not show signs of low burnout, they showed significantly higher levels of work engagement, mindfulness, and well-being than Dutch teachers in general. However, the compared sample sizes differed greatly and therefore the validity of these significant results might be reduced. The burnout scores were moderate for most teachers apart from one who met all three criteria for high levels of burnout. Based on the qualitative part of this study, the teachers reported high amounts of workload, time constraint, stress, and dissatisfaction with the educational system which coincides with the findings of many other research papers (e.g., Ballet & Kelchtermans, 2009).

On the other hand, all teachers scored significantly higher in work engagement scale which, according to Deer (2020), could be connected to the amount of workplace related positive activities the teachers engaged in, potentially mindfulness practise. Based on the Job Demands – Resources Model of burnout (Demerouti, et al., 2001), burnout is connected to high demands and decreasing mental and physical resources leading to ill health. However, based on the findings of Hakanen, Bakker and Schaufeli (2006), work engagement seems to mediate the effects of job resources on organisational commitment and motivation and therefore with more commitment and more resources, the potential for burnout lowers. In this sample of teachers, it seems that although teachers showed symptoms of moderate level of burnout, they had high level of work engagement which is connected to having more resources available to them and therefore we can assume that the *Super Chill Mindfulness app* could have served as this additional resource the teachers had available to use at any time.

The results from the qualitative phase showed some perceived benefits of using the *Super Chill Mindfulness app*. One of these benefits was improved teacher-student relationships in class and also student-student relationships: *"By doing the mindfulness exercises, the distance between the teachers and the students become smaller."* Mackenzie et al. (2020) in their research paper state that improving social-emotional competence in teachers and establishing a better classroom management serves as a prevention against the symptoms of burnout and it leads towards better teacher and also student well-being.

Interestingly, 77% of the teachers within this study reported that the *Super Chill Mindfulness app* has helped them to have more opportunities to promote students´ emotional and social well-being. Furthermore, good teacher-student relationships and good atmosphere in the class help teachers to cope better with stress (Aloe, Amo & Shanahan, 2014; Spilt, Koomen & Thijs, 2011).

Social and emotional well-being scores and also the mindfulness scores within the sample of teachers in this study was generally higher than scores in the normative Dutch sample. Vonderlin et al. (2020) says that increased levels of mindfulness lead to better well-being. Teachers in the qualitative part of this study mentioned that: *"When you have to work again, the mindfulness practise is also good for my relaxation even it was only 3 or 4 minutes of mindfulness focus."* or *"Having mandatory mindfulness exercises is nice to getting some relaxation within a busy day."* Based on the article by Meiklejohn (2012), the students of teachers who receive a mindfulness intervention can also benefit. This was also reported by teachers in the qualitative part of this study in which they mentioned that: *"Mindfulness benefits are better behaviour towards others, concentration during the day and reflection."*

In terms of the research questions, the teachers did find the app useful and easy to use. However, they found it difficult to make time to use the app outside work: *"I wanted to try the app outside of my workplace, but I didn't find the time."* One teacher suggested that mindfulness should be mandatory and scheduled next to the other lessons as students tend to focus better after practising mindfulness and also teachers feel more relaxed within a busy day.

There was also an important recommendation made by the participants in this study and that was for the teacher to be a role model to the children. In the article of Carsley, Khoury and Heath (2018), the authors found that the follow up effects of mindfulness practise were more significant if the teachers themselves practised mindfulness with the children rather than having an external facilitator coming in. This was mentioned by two of the teachers as well: *"Students can be a little bit more self-conscious if there would be a stranger teaching them mindfulness, when it is just a board and the app, it is more safe to deal with the exercises."* and *"To be motivated to practise mindfulness with your children, you should practise also by yourself."*.

Based on the recommendations from the teachers, it would be good to include some tips and maybe a manual to determine which exercise in the *Super Chill Mindfulness app* should function as an energizer and which exercise should calm the students down. In terms of the exercise guidance, the teachers thought it was sufficient and beneficial for the students to have a safe environment in which they could also strengthen the relationship with the teacher during engaging in mindfulness practise if the teacher joined.

Although there have been many important insights contributing towards the knowledge about the benefits of using a mindfulness app in education, the results did not show any significance. This research was explorative and therefore there is a need for further investigation whether using mindfulness apps in the educational system could have the potential of combating burnout and helping teachers to cope better with this demanding and stressful job. Based on the qualitative phase, there is a big motivation and need for including mindfulness practise into the schedule, however, the support from within the educational system is still very low. As it was mentioned by DiCarlo, Meaux and LaBiche (2020), low cost, low labour-intensive interventions are effective in improving classroom conditions both for teachers and students and therefore app-based mindfulness intervention still have a huge potential to improve the well-being of teachers in schools across the globe. The ideas for future research in this area and also limitations of this study are presented within the next section.

5. Limitations and future research

The limitations of this study are several. First, because of the pilot-nature of this study, the sample of participants was quite small and not randomised, and the teachers self-selected themselves based on their own interest and motivation to take part in the Super Chill Mindfulness pilot, which limits reliability of the outcomes and generalisability to other populations. Second, we did not use pre- and post-measures because of the same reason as mentioned above. Therefore, the measured scores were based only on post-measures after a 4-weeks pilot mindfulness intervention, which limits causal inference of the outcomes. The use of comparisons to outcomes in norm groups did provide some perspective in this matter, but a longitudinal design would be warranted for full causal analyses.

Although studies show that also a short-term engagement with a mindfulness-based smartphone app has a beneficial impact on several aspects of well-being and that smartphone apps show to be an effective delivery medium for mindfulness practise (Champion, Economides & Chandler, 2018; Economides et al., 2018), teachers in this study had already some experience with mindfulness prior to this pilot and without a pre- and post-measure it is hard to determine the impact of this particular intervention. Because of the explorative nature of this pilot study, we did not include a control group in this study, which prevented comparisons between groups. Further studies in a randomised controlled design are warranted.

Also, due to the Covid – 19 world pandemic, it was more challenging to have enough participants for the second, qualitative phase of this study. There were 12 teachers who agreed to take part in the semi-structured interviews, however, only three of them took part. Full topic saturation was therefore not possible to ensure and therefore this limitation should be addressed in future studies. Moreover, the interviews were conducted in English which was not the native language of neither the participants nor the researcher which could have been also an influencing factor for lower topic saturation.

Future studies should further investigate the impact of mindfulness-based smartphone apps used by teachers within the educational system as it seems very promising in terms of combating burnout symptoms, increasing the level of work engagement and lowering teachers' level of stress and therefore attrition. The future research should include a randomised control group trial to ensure the quality of the research design. The mixed methods approach seemed to be beneficial as it could offer more insights and information about the impact of a mindfulness-based smartphone app intervention and therefore would be a recommended approach for further studies.

6. Conclusion

At this moment it is still up to the individual teachers to start implementing mindfulness into their teaching and because of the high job demands, tight schedule and a lack of awareness and understanding of the benefits of mindfulness practise, only those who are confident and experienced in mindfulness seem to succeed. However, as one of the teachers said: *"Mindfulness is for everybody and it is growing."*, it would be worth the time

to further investigate the effects of mindfulness on teachers as with new technology, we now can offer teachers a mindfulness-based smartphone app intervention which could be a low cost, easy to use and time-effective way how to help teachers, and their students, with their stressful jobs.

Teachers who have enough resources to cope with daily stress of the job are not that much affected by the symptoms of burnout and therefore can offer better quality teaching to their students. As one of the teachers said: “Mindfulness in education would be beneficial.” and more research is needed to ensure bigger support also on the system level.

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8. Appendices

8.1. Appendix 1: Maslach Burnout Inventory for Educators – Dutch version

Lees de volgende uitspraken nauwkeurig en bepaal hoe u zich voelt over uw werk en kruis vervolgens het best passende cijfer (0) nooit - (6) altijd, dagelijks aan.

0	1	2	3	4	5	6
nooit						altijd/dagelijks

1. Ik voel me mentaal uitgeput door mijn werk.
2. Aan het einde van een werkdag voel ik me leeg.
3. Ik voel me vermoeid als ik 's morgens opsta en er weer een werkdag voor me ligt.
4. Ik kan me gemakkelijk in de belevingswereld van leerlingen verplaatsen.
5. Ik heb het gevoel dat ik sommige leerlingen te onpersoonlijk behandel.
6. De hele dag met mensen werken vormt een zware belasting voor mij.
7. Ik weet de problemen van mijn leerlingen adequaat op te lossen.
8. Ik voel me 'opgebrand' door mijn werk.
9. Ik heb het gevoel dat ik het leven van andere mensen op een positieve manier beïnvloed door mijn werk.
10. Ik heb het idee dat ik onverschilliger ben geworden tegenover andere mensen sinds ik deze baan heb.
11. Ik maak me zorgen dat mijn werk me emotioneel verhardt.
12. Ik voel me gefrustreerd door mijn baan.
13. Ik denk dat ik me teveel inzet voor mijn werk.
14. Het kan mij niet echt schelen wat er van mijn leerlingen terecht komt.
15. Ik kan gemakkelijk een ontspannen sfeer scheppen met mijn leerlingen.
16. Als het lesgeven er op zit, kijk ik er tevreden op terug.
17. Ik heb in deze baan veel waardevolle dingen bereikt.
18. Ik voel me aan het einde van mijn latijn.
19. In mijn werk ga ik heel rustig om met emotionele problemen.
20. Ik heb het gevoel dat leerlingen mij de schuld geven van hun leerproblemen.
21. Ik wordt op mijn werk lastig gevallen met persoonlijke zaken waar ik eigenlijk niets mee te maken wil hebben.
22. Ik probeer me afzijdig te houden van de persoonlijke problemen van mijn leerlingen.

8.2. Appendix 2: Utrecht Work Engagement Scale – Dutch version, short form

Werkbelevingslijst (UBES) ©

*De volgende uitspraken hebben betrekking op hoe u uw werk beleeft en hoe u zich daarbij voelt. Wilt u aangeven hoe vaak iedere uitspraak op u van toepassing is door steeds het **best passende** cijfer (van 0 tot 6) in te vullen?*

	Sporadisch	Af en toe	Regelmatig	Dikwijls	Zeer dikwijls	Altijd
0	1	2	3	4	5	6
Nooit	Een paar keer per jaar of minder	Eens per maand of minder	Een paar keer per maand	Eens per week	Een paar keer per week	Dagelijks

1. _____ Op mijn werk bruis ik van energie. *(VI01)*
2. _____ Als ik werk voel ik me fit en sterk. *(VI02)*
3. _____ Ik ben enthousiast over mijn baan. *(DE02)*
4. _____ Mijn werk inspireert mij. *(DE03)*
5. _____ Als ik 's morgens opsta heb ik zin om aan het werk te gaan *(VI03)*
6. _____ Wanneer ik heel intensief aan het werk ben, voel ik mij gelukkig. *(AB03)*
7. _____ Ik ben trots op het werk dat ik doe. *(DE04)*
8. _____ Ik ga helemaal op in mijn werk. *(AB04)*
9. _____ Mijn werk brengt mij in vervoering. *(AB05)*

8.3. Appendix 3: Five Facets Mindfulness Questionnaire –Dutch version, short form

Five Facet Mindfulness Questionnaire (FFMQ)

Hieronder staan verschillende uitspraken. Geef voor elke uitspraak aan hoe vaak deze voor u in het algemeen waar is.

Nooit of bijna nooit waar	Zelden waar	Soms waar	Vaak waar	Heel vaak of altijd waar
(1)	(2)	(3)	(4)	(5)

1. _____ Ik ben goed in het vinden van woorden om mijn gevoelens te beschrijven.
2. _____ Ik kan makkelijk mijn overtuigingen, meningen en verwachtingen onder …… woorden brengen.
3. _____ Ik observeer mijn gevoelens zonder dat ik me er helemaal door laat meeslepen.
4. _____ Ik zeg tegen mezelf dat ik me niet zo zou moeten voelen als ik me voel.
5. _____ Het is moeilijk voor me om de woorden te vinden die mijn gedachten …… beschrijven.
6. _____ Ik let op lichamelijke ervaringen, zoals de wind in mijn haar of de zon op mijn …… gezicht.
7. _____ Ik oordeel of mijn gedachten goed of fout zijn.
8. _____ Ik vind het moeilijk om mijn aandacht te houden bij wat er op dit moment …… gebeurt.
9. _____ Als ik verontrustende gedachten heb of beelden zie, dan laat ik me daar niet …… door meevoeren.
10. _____ Ik let in het algemeen op geluiden zoals het tikken van een klok, het fluiten van …… de vogels of het voorbijrijden van een auto.
11. _____ Als ik iets in mijn lichaam voel, kost het me moeite om de juiste woorden te …… vinden om het te beschrijven.
12. _____ Het lijkt alsof ik op de 'automatische piloot' sta zonder dat ik me erg bewust ben …… van wat ik doe.
13. _____ Als ik verontrustende gedachten heb of beelden zie, voel ik me kort daarna weer …… rustig.
14. _____ Ik zeg tegen mezelf dat ik niet moet denken zoals ik denk.
15. _____ Ik merk de geur en het aroma van dingen op.
16. _____ Zelfs als ik heel erg overstuur ben kan ik dit op een of andere manier onder …… woorden brengen.
17. _____ Ik doe activiteiten gehaast zonder dat ik er echt aandacht voor heb.
18. _____ Als ik verontrustende gedachten heb of beelden zie, kan ik ze opmerken zonder …… iets te doen.
19. _____ Ik denk dat mijn emoties soms slecht of ongepast zijn en dat ik ze niet zou …… moeten voelen.
20. _____ Ik merk de visuele aspecten van kunst of de natuur op, zoals kleur, vorm, …… structuur of patronen van licht en donker.
21. _____ Als ik verontrustende gedachten heb of beelden zie, merk ik ze op laat ze los.
22. _____ Ik doe mijn werk of taken automatisch zonder dat ik me bewust ben van wat ik …… doe.
23. _____ Ik merk dat ik vaak dingen doe zonder er aandacht aan te besteden.
24. _____ Ik keur mezelf af als ik onlogische gedachtes heb.

8.4. Appendix 4: Mental Health Continuum – Dutch version, short form

Mental Health Continuum – Short Form

De volgende vragen gaan over hoe u zich de afgelopen maand heeft gevoeld.
Kies het antwoord dat het beste weergeeft hoe vaak u een bepaald gevoel heeft ervaren of gevoeld.

(0)	(1)	(2)	(3)	(4)	(5)
Nooit	Eenmaal of tweemaal	Ongeveer een keer per week	Ongeveer 2 of 3 keer per week	Bijna elke dag	Elke dag

Hoe vaak voelde u zich de afgelopen maand:

1. _____ gelukkig?
2. _____ geïnteresseerd in het leven?
3. _____ tevreden met het leven?
4. _____ dat u iets belangrijks had om bij te dragen aan de samenleving?
5. _____ dat u tot een gemeenschap behoorde (zoals een sociale groep of uw buurt)?
6. _____ dat onze samenleving een goede plek is, of een ..... betere plek aan het worden is, voor alle mensen?
7. _____ dat mensen in principe goed zijn?
8. _____ dat de manier waarop onze samenleving werkt zinvol voor u is?
9. _____ dat je de meeste delen van je persoonlijkheid leuk vond?
10. _____ goed in het beheren van de verantwoordelijkheden van uw dagelijkse leven?
11. _____ dat u warme en vertrouwensvolle relaties met anderen had?
12. _____ dat u ervaringen had die u uitdaagden om te groeien en een beter mens te worden?
13. _____ zelfverzekerd om na te denken of uw eigen ideeën en meningen te uiten?
14. _____ dat je leven een gevoel van richting of betekenis heeft?

8.5. Appendix 5: Semi - structured interview structure

Interview questions

Intro: Hello …….... Thank you for taking your time for this interview, I really appreciate it. My name is Kristyna Seniglova, I am a MSc student at the University of Twente. Before we start, I would like to ask you whether you read the study consent form which I sent you? (If no, I can read it to you….) If yes, do you agree with everything that was mentioned in the form, do I have your full consent? … Do you have any questions before we start? … Thank you.

… Before I ask you about the SuperChill app, I would like to first ask about your experience with mindfulness …

1) **What is your experience with mindfulness?** (5 mins)
   a) Did you already have an experience prior to the SuperChill app pilot?
   b) If yes, what kind of mindfulness was it (yoga, meditation, mindfulness app, online training, in person training)? How long ago did you start with it?
   c) Tell me about your practise now, how long have you been practising, how often do you practise, what kind of mindfulness do you practise, do you still practise in these days?

2) **How was your experience with the SuperChill mindfulness app?** (10 mins)
   a) Have you noticed any changes in your daily life?
   b) What impact, if any, has the mindfulness app had on your level of stress?
   c) Have you noticed any changes in terms of your relationship towards your work in general?
   d) Have you noticed any changes in terms of how you feel in general?

3) **How was your experience using the app in the classroom?** (10 mins)
   a) Did you notice any changes in terms of your relationship towards your students?
   b) What about classroom management (e.g., dealing with challenging behaviour), did you notice any changes based on using the app?
   c) Is there anything in the app that you found especially inspiring or useful?

4) **Do you think that using mindfulness in education would be beneficial?** (5 mins)
   a) If yes, how, what kind of benefits would it bring?

5) **Were there any potential challenges or obstacles to using the app or delivering the mindfulness exercises to the students?** (5 mins)
   a) Was it easy to understand the instructions and do the exercises?
   b) Were there any barriers in terms of engaging with the app?
   c) Did you feel that the app offered you a sufficient guidance throughout the mindfulness exercises or would you rather prefer an in-person training instead?

- **Any other reflections?** (extra 5 mins)

8.6. Appendix 6: Ethical approval for this study

UNIVERSITY OF TWENTE.

FACULTY BMS

201147 REQUEST FOR ETHICAL REVIEW

Request nr: 201147

Researcher: Bruin, E.J. de

Supervisor: -

Reviewer: Klooster, P.M. ten

Status: Approved by commission

Version: 2

1. START

A. TITLE AND CONTEXT OF THE RESEARCH PROJECT

1. What is the title of the research project? (max. 100 characters)

Pilot research of use of a mindfulness-app by teachers in primary education

2. In which context will you conduct this research?

Master's Thesis

3. Date of the application

17-09-2020

5. Is this research project closely connected to a research project previously assessed by the BMS Ethics Committee?

No/Unknown

B. CONTACT INFORMATION

6. Contact information for the

lead researcher 6a.

Initials:

E.J.

6b. Surname: de Bruin

6c. Education/Department (if applicable):

BMS-PGT

6d. Staff or Student number:

76673813

6e. Email address:

e.j.debruin@utwente.nl

6f. Telephone number (during the research project):

+31618551888

6g. If additional researchers (students and/or staff) will be involved in carrying out this research, please name them:

Sophia Bauhuf, s.bauhuf@student.utwente.nl. Kristyna Šeniglová, k.seniglova@student.utwente.nl 6h.

Have you completed a PhD degree?

Yes

8. Is one of the ethics committee reviewers involved in your research? Note: not everyone is a reviewer.

No

C. RESEARCH PROJECT DESCRIPTION

9a. Please provide a brief description (150 words max.) of the background and aim(s) of your research project in non-expert language.

This is a pilotstudy of the experiences of teachers in primary education with the use of a mindfulness-app. The app contains mindfulness and yoga exercises that teachers can use themselves to cope with high stress and intense workload, and can use in their classrooms with the children. The app is developed by Super Chill foundation, which is organized specifically for development and implementation of this app. Its board consists of international mindfulness expert and professor in developmental psychology at the UvA, Susan Bögels, and Muriël Siebel from Rituals (who is also the project-leader and finances the app). Super Chill will hold a pilot with 100 teachers nationwide for 4 weeks, to determine how the app can be improved regarding set-up, layout, content and usability. Furthermore, students from UTwente will conduct a questionnaire pilot research with the participating teachers into effects of the app on stress, cognitive worry, well-being, and mindfulness.

9b. Approximate starting date/end date of data collection:

Starting date: 2020-10-24

End date: 2021-01-07

9c. If applicable: indicate which external organization(s) has/have commissioned and/or provided funding for your research.

Commissioning organization(s):

Not applicable

Funding organization(s):

Not applicable

2. TYPE OF STUDY

Please select the type of study you plan to conduct:

I will be collecting new data from individuals acting as respondents, interviewees, participants or informants.

4. RESEARCH INVOLVING THE COLLECTION OF NEW DATA

A: RESEARCH POPULATION

20. Please provide a brief description of the intended research population(s):

    Participants will be 100 Dutch teachers in primary education that have been recruited by Super Chill foundation to take part in their pilot research with the app.

21. How many individuals will be involved in your research?

    Approximately 100 Dutch teachers in primary education

22. Which characteristics must participants/sources possess in order to be included in your research?

    Be teacher in primary education, and participate in the pilot research from Super Chill foundation.

23. Does this research specifically target minors (<16 years), people with cognitive impairments, people under institutional care (e.g. hospitals, nursing homes, prisons), specific ethnic groups, people in another country or any other special group that may be more vulnerable than the general population?

    No

24. Are you planning to recruit participants for your research through the BMS test subject pool, SONA

    No

B. METHODS OF DATA COLLECTION

25. What is the best description of your research?

    - (Online) survey research

26. Please describe the activities that participants in your research will perform, max. 2000 characters, including spaces:

    The participating primary school teachers will, after 4 weeks of using the prototype of the app, fill out an online questionnaire with 150 Likert scale questions about stress, mental well-being, mindfulness and cognitive rumination.

How much time will each participant spend (mention the number of sessions/meetings in which they will participate and the time per session/meeting)?

1 online session to fill out the questionnaire in about 20 minutes

C: BURDEN AND RISKS OF PARTICIPATION

27. Please provide a brief description of these burdens and/or risks and how you plan to minimize them:

    The participants will be informed extensively about the aims of this study, and which kinds of data will be collected.

The use of questionnaires in psychological research with a normal population (i.e. not a clinical sample of people with psychological problems) does not pose a significant risk to physical or mental health.

28. Can the participants benefit from the research and/or their participation in any way?

Yes

Please Explain:

The participants may, by answering the questionnaires, gain some more insight in their own process of using the app and applying mindfulness and yoga in their everyday life.

29. Will the study expose the researcher to any risks (e.g. when collecting data in potentially dangerous environments or through dangerous activities, when dealing with sensitive or distressing topics, or when working in a setting that may pose 'lone worker' risks)?

No

D. INFORMED CONSENT

30. Will you inform potential research participants (and/or their legal repsentative(s), in case of noncompetent participants) about the aims, activities, burdens and risks of the research before they decide whether to take part in the research?

Yes

Briefly clarify how:

We will provide an information letter that contains an explanation of the research, and the subjects of the questions that will be asked in the questionnaires for the participants. This means that participation is voluntary, participants can decline to participate, also after already starting participation, the data will be processed anonymously, and results can not be tracked back to individual participants, the data will only be used for the current study, and will be deleted after a maximum of 2 years. The letter will also contain names and details of the responsible researchers and contact person(s) for questions about the research and rights of research participants.

32. How will you obtain the voluntary, informed consent of the research participants (or their legal repsentatives in case of non-competent participants)?

Active online consent

33. Will you clearly inform research participants that they can withdraw from the research at any time without explanation/justification?

Yes

34. Are the research participants somehow dependent on or in a subordinate position to the researcher(s) (e.g. students or relatives)?

No

35. Will participants receive any rewards, incentives or payments for participating in the research?

- No

36. In the interest of transparency, it is a good practice to inform participants about what will happen after their participation is completed. How will you inform participants about what will happen after their participation is concluded?

- Participants will receive the researcher's contact details, so that they can contact the researcher if they have questions/would like to know more.
- Participants will receive oral/written information about what the researcher(s) will do with the collected data.
- Participants who indicate they are interested will receive a summary of the research results.

E. CONFIDENTIALITY AND ANONYMITY

37. Does the dataset contain personal identifiable information that can be traced back to specific individuals/organizations?

No

39. Will you make use of audio or video recording?

No

5. DATA MANAGEMENT

- I have read the UT Data policy.
- I am aware of my responsibilities for the proper handling of data, regarding working with personal data, storage of data, sharing and presentation/publication of data.

6. OTHER POTENTIAL ETHICAL ISSUES/CONFLICTS OF INTEREST

40. Do you anticipate any other ethical issues/conflicts of interest in your research project that have not been previously noted in this application? Please state any issues and explain how you propose to deal with them. Additionally, if known indicate the purpose your results have (i.e. the results are used for e.g. policy, management, strategic or societal purposes).

No

7. ATTACHMENTS

SuperChillToestemmingsverklaring.pdf

8. COMMENTS

Klooster, P.M. ten (18-09-2020 16:48):

NB: The approval given for your research project is CONDITIONAL. If your study intends to make use of methods requiring social and physical interaction, this poses risks for both participants and researchers, which have to be taken into account. You have to COMPLY with the current RESTRICTIONS ON SOCIAL AND PHYSICAL INTERACTION regarding the COVID19 outbreak. This may imply that you have to find alternative ways to collect data or to delay the start of your study until the restrictions have been adjusted or lifted. If adjustments lead to substantive changes in the design of your study (excluded: digital/online means to get in contact with your participants), send your changes to ethicscommittee-bms@utwente.nl stating your request number. Please consult the standing guidelines of the UT and national authorities on research and educational activities www.utwente.nl/corona Klooster, P.M. ten (18-09-2020 16:48):
With respect to item 37, make sure that the online software also doesn't store IP addresses, as these are also considered personal identifiable information (e.g., you can turn off IP adress colelction in for instance Qualtrics).

9. CONCLUSION

Status: Approved by commission

The ethical committee has assessed the ethical aspects of your research project. On the basis of the information you provided, the committee does not have any ethical concerns regarding this research project. It is your responsibility to ensure that the research is carried out in line with the information provided in the application you submitted for ethical review. If you make changes to the proposal that affect the approach to research on humans, you must resubmit the changed project or grant agreement to the ethical committee with these changes highlighted.

Moreover, novel ethical issues may emerge while carrying out your research. It is important that you reconsider and discuss the ethical aspects and implications of your research regularly, and that you proceed as a responsible scientist.

Finally, your research is subject to regulations such as the EU General Data Protection Regulation (GDPR), the Code of Conduct for the use of personal data in Scientific Research by VSNU (the Association of Universities in the Netherlands), further codes of conduct that are applicable in your field, and the obligation to report a security incident (data breach or otherwise) at the UT

8.7. Appendix 7: Participant consent form

UT – University of Twente

Toestemmingsverklaring

Title of Project: Effecten van een mindfulness-app voor docenten in het basisonderwijs

Name of Researchers: Sophia Bauhuf; Kristyna Seniglova

Name of supervisor: Dr. E.J. De Bruin

Aim of the research:

Voor dit onderzoek werken we samen met de Super Chill Foundation naar de voordelen van de Mindfulness-app die wordt getest op basisscholen in heel Nederland. Ons doel is om de effecten van het gebruik van de app te onderzoeken op welzijn, zelfeffectiviteit, zelfregulatie, zelfcompassie, mindfulness bij docenten en de hoeveelheid stress die docenten ervaren. De gegevens die met deze vragenlijst worden verzameld, worden anoniem verwerkt.

Ik verklaar hierbij op voor mij duidelijke wijze te zijn ingelicht over de aard en methode van het onderzoek, zoals hierboven uiteengezet.

Ik stem geheel vrijwillig in met deelname aan dit onderzoek. Ik behoud daarbij het recht deze instemming weer in te trekken zonder dat ik daarvoor een reden behoef op te geven en besef dat ik op elk moment mag stoppen met het onderzoek. Indien mijn onderzoeksresultaten gebruikt worden in wetenschappelijke publicaties, dan wel op een andere manier openbaar worden gemaakt, gebeurt dit volledig geanonimiseerd. Mijn persoonsgegevens worden niet door derden ingezien zonder mijn uitdrukkelijke schriftelijke toestemming.

Ik geef de onderzoekers toestemming mijn persoonsgegevens te bewaren tot twee jaar na afloop van het gehele onderzoek.

Als ik nog verdere informatie over het onderzoek zou willen krijgen, nu of in de toekomst, kan ik me wenden tot dr. E.J. de Bruin, postbus 217, 7500 AE Enschede, tel. 020 053-489 4470, e-mail: E.J.deBruin@Utwente.nl.

8.8. Appendix 8: Questions about usability and other benefits

1. Hoe vaak heb je de app in de klas gebruikt? (7-punts Likert-schaal; Nooit, Bijna nooit, Zelden, Soms, Vaak, Heel vaak, Elke dag)

2. Hoe vaak heb je de app in je privéleven gebruikt? (7-punts Likert-schaal; Nooit, Bijna nooit, Zelden, Soms, Vaak, Heel vaak, Elke dag)

3. De app heeft mijn kennis over / begrip van mindfulness vergroot. (7-punts Likert-schaal; zeer mee eens - zeer mee oneens)

4. De app was nuttig voor mijn eigen gezondheid en welzijn. (7-punts Likert-schaal; zeer mee eens - zeer mee oneens)

5. De app verbeterde mijn vermogen om met moeilijk/storend gedrag in de klas om te gaan (7-punts Likert-schaal; zeer mee eens - zeer mee oneens)

6. Ik voelde me minder gestrest door het gebruik van de mindfulness-oefeningen van de app (7-punts Likert-schaal; helemaal mee eens - helemaal niet mee eens)

7. De app hielp me om mijn klas effectief te leiden. (7-punts Likert-schaal; zeer mee eens - zeer mee oneens)

8. Door de app in de klas te gebruiken, had ik meer mogelijkheden om het emotionele en sociale welzijn van leerlingen te bevorderen. (7-punts Likert-schaal; zeer mee eens - zeer mee oneens)

9. Ik voelde me op mijn gemak bij het gebruik van de app in de klas. (7-punts Likert-schaal; zeer mee eens - zeer mee oneens)

10. Had je voorafgaand aan de pilot met de SuperChill app ervaring met yoga, mindfulness, of meditatie? (Ja/Nee)

11. Zo ja, hoe vaak beoefen je mindfulness, meditatie en/of yoga? (Nooit; Minder dan eens per maand; Maandelijks; Wekelijks; 2 keer of vaker per week; Dagelijks)

12. Hoe lang beoefen je dit al? (Nooit; Ongeveer een maand; 1-3 maanden; 3-6 maanden; 6 maanden - 1 jaar; Langer dan een jaar)

8.9. Appendix 9: Participant interview consent form

UT – University of Twente

STUDY CONSENT FORM

Title of Project: Benefits of using a mindfulness-app by teachers in primary education

Name of Researchers: Sophia Bauhuf; Kristyna Seniglova

Name of supervisor: Dr. E.J. De Bruin

Aim of the research:

For this research, we are working with the Super Chill Foundation on the benefits of the Mindfulness app that is being tested in primary schools throughout the Netherlands. Our goal is to investigate the effects of using the app on wellbeing, self-efficacy, self-regulation, mindfulness, and the amount of stress experienced by teachers. The data collected with this interview will be processed anonymously. The interview will take about 30 – 45 minutes and it will take place online (via Zoom, Microsoft Teams or Skype according to your preference). The whole interview will be recorded.

I hereby declare that I have been clearly informed about the nature and method of the investigation, as set out above. I fully agree to participate in this study and have my interview recorded. I reserve the right to withdraw this consent without having to give a reason and realize that I may stop the investigation at any time. If my research results are used in a scientific publications or made public in any other way, this will be done completely anonymously. My personal data will not be viewed by third parties without my written permission. I give the researchers permission to keep my personal data for up to two years after the end of the entire investigation. If I would like further information about the study, now or in the future, I can turn to Dr. E. J. de Bruin, PO Box 217, 7500 AE Enschede, tel. 020 053-489 4470, e-mail: E.J.deBruin@Utwente.nl